ARCH, 1933

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Contractors and Engineers Monthly

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Removing Silt from the Great Miami River, Hamilton, Ohio

See Page 27

WHERE ENDURANCE means everything

Equip with

EUCLID

PERMO-ARCH "TRACK-WHEELS"

with drop-forged hooks

SHIFT AFTER SHIFT—continuous, uninterrupted service—equipment must not *break down!* Reasonable care and maintenance—Yes, but no more than that. Bids are figured too closely these days to allow for the collapse of faulty or inefficient equipment.

Take a look at the above picture. Can you imagine "worse going" from the standpoint of equipment abuse. Loaded with Rock . . . hauled over stones and boulders, this Euclid Tu-Way on Permo-Arch "Track-Wheels" has been working for months down in the West Virginia mountains. ABUSED . . . Yes . . . but still doing the job for which it was sold.

Contractors have no place for "Blarney" or extravagant guarantees when a "Job is on" and a completion date must be met. They have learned that they can depend on units equipped with Euclid "Track-Wheels" . . . that's how Euclid "Track-Wheels" earned their popularity.

EUCLID Permo-Arch "Track-Wheels" with the drop-forged Hooks were developed and field-tested during the latter part of 1931. They were sold all over the country during 1932. Today we have the enthusiastic support of contractors to back up our statement that it is the best "Proved" Track Assembly in the industry.

Euclid "Track-Wheels" fit all makes of crawler wagons. See your Dealer—or write us direct for further information and prices.

THE EUCLID ROAD MACHINERY COMPANY

CLEVELAND OHIO

Tandem Pavers *on a* 20.5-Mile Job *in* South Carolina

A. P. Little, Superintendent

Harrison Engineering & Construction Corp., of Kansas City, Mo., Assisted State by Helping to Finance Own Work and Completed Fine Highway

ACCOUNTING in such a form that each day the Superintendent knew just how much his concrete was costing him and how his work compared with his previous jobs and with other outfits operated by the same company, and above all the ever important concern, "Is this one job paying its way?" was a feature of the work of the Harrison Engineering & Construction Corp., visited at Inman, S. C.

Tandem pavers were used with special rigging that speeded up the production under the very strict inspection of the state engineers. Another interesting event in the work was the location of the batching plant on the highway itself and the need for moving it when the paver came along.

Jetting the Fills

On the fills which were more than 3 feet in depth it was necessary for the contractor to jet them to insure complete settlement. The rough grading was done by another contractor before the award of the paving contract but the jetting was included in the paving contract. All jetting was started at the low point of the fill and dikes were thrown up, creating pools 5 feet square, in the center of which the jets were sunk. The jets were 1-inch pipe hammered down to a ½-inch nozzle at the end and used with 1-inch hose. The jets were permitted to sink under their own weight but as soon as any jet stopped sinking it was held at that point until water began to appear at the top and then allowed to sink again until it stopped. After a single section was jetted it was kept filled with water between the dikes for 2 days and then the jet holes backfilled with suitable material.

Preparing the Grade

As the rough grade had stood for some time under the action of the weather the contractor had to reshape it with a Caterpillar Super Mogul 12-foot blade grader pulled by a Sixty tractor. The entire 20.5 miles of the grade was prepared in this manner, ready for the fast work of the paving crew. The new paving extended from the North Carolina state line to within 3 miles of the city limits of Spartanburg, S. C.

Fine Grade and Form Setting

As labor is so cheap in South Carolina the contractor found it to his financial advantage to keep some of his equipment in a yard on the job and use local labor instead. This had the added humane advantage of enabling some men to earn a living instead of living on local charity. The pay for farm laborers in the locality was 75 cents and $1.00 a day for 10 hours work, but this contractor paid $1.50 for labor which was in line with wages paid by other contractors working in this section. A man must earn enough to at least feed himself if he is to turn in a satisfactory day's work. And there are few men in that part of the country who have not close to a half dozen other mouths to feed.

A rather sad commentary on the intelligence of the

local labor that could not all be absorbed by the contractor was shown in the amount of vandalism that occurred. It was necessary to put watchmen on every piece of isolated equipment on the job both night and day to prevent serious damage to the equipment and the constant theft of gasoline. On one night all the hand wheels of a grading machine were smashed with a heavy hammer, thus making it impossible to use that piece of equipment until an entire set of new wheels was received. On another night all the spark plugs on the small gasoline shovel were smashed and the carburetor completely destroyed. It is only ignorant foolhardy individuals that will do damage like this which cannot redound to their advantage in possible labor. This trouble is not entirely a local matter as it has been noted in other states where foreign contractors have been awarded projects.

All the form trenches were cut with remarkable accuracy and speed by a crew of ten negro laborers. The subgrade crown was a parabola as was also the pavement itself, giving a concrete slab 7½:6:7½ inches for the regular pavement and which was thickened to 8:6½:8 inches on fills. Also on all fills center steel was installed and the pavement was reinforced with a 6-inch spot welded mesh over all cattle passes. The mesh was furnished by the Wheeling Steel Co., from its Portsmouth, Ohio, works.

One form setter and a helper on each side set the 8-inch Blaw-Knox forms with 8-inch bases. As soon as the forms were set and the way clear a Lakewood steel subgrader was pulled over the forms by the 10-ton Buffalo-Springfield gas roller. High spots were removed and low spots filled with a Caterpillar 7-foot blade grader pulled by a Thirty tractor and using the Thirty with a Western rotary scraper and also a mule team which could maneuver readily between other pieces of equipment. Four hand laborers were used to shovel as needed in the preparation of the fine grade. Two men with four helpers lined up the forms and tamped along the base as necessary behind the subgrader. This work is one on which the state inspectors placed great weight and the line and grade of the forms was watched constantly.

Batching the Aggregate and Cement

The contractor used the same equipment for the batching plant as it was our privilege to note in action on his job at Carroll, Iowa, during the 1931 construction season. In fact several familiar faces were seen during the visit to the job and the same cordial spirit of cooperation was evident throughout the work. The batching plant was located at four different set-ups during the work. The first and last of these were the same, made necessary because of detours. The job ran roughly north and south with the North Carolina state line at the north end and the city of Spartanburg at the south end. The first set-up was at Campton about 4 miles north of Spartanburg, the second at Landrum, 3½ miles south of the north end of the work, the third at Mascott about the center of the job and the last was at Campton again. In general the set-ups were along the side of a spur track where the Koehring crane with its 45-foot boom could swing the 1-yard Blaw-Knox clamshell bucket readily from the gondola cars to the Blaw-Knox batching plant or to the stockpiles.

The job was paved in the following sequence, an appreciation of which is necessary to understand the unusual situation that existed at Landrum where the batching plant straddled the grade of the pavement. The first paving was 4 miles north from the Spartanburg end toward the Campton location of the batching plant. The second was the 3½ miles from the North Carolina state line toward the Landrum batching plant set-up. The third was from a point 4½ miles south of Landrum to the batching plant. Then with the batching plant at Mascott the 5½ miles north of the plant was paved working south toward the plant. Then 2½ miles was paved north toward the plant leaving the remaining gap to be paved with the batching plant again at Campton and the work done running south.

The Landrum batching plant set-up was located right in the middle of the grade as the spur track was close by and there was not much room for the crane. When the third run described, north into Landrum, was nearing completion the bin had to be moved to permit the paver to run over the section. All the trucks were loaded with batches, the remaining sand and stone in the bins run out into other trucks and the bins moved to the side of the road so that the pavers could complete the link. One of the photographs, furnished by the Superintendent, shows the unusual situation of paver, crane and batching plant sitting alongside each other while the paver works away.

The sand and stone were furnished by the contractor and the cement by the state. The sand came from S. W. Wilson & Son, agents for the Southern Silica Mining & Mfg. Co. of Columbia, S. C. The sand which passes the state specifications is an unusually fine one for concrete paving. The stone came from the Holston Quarry Co. of Liberty, S. C. About 12 cars of stone and 6 cars of sand were unloaded for the work each day of normal operation. The cement came from several different cement companies, and after December 31, 1931, this material was paid for by notes issued by the State.

The hauling of the batches was done by Wells & McLean of Asheville, N. C., hauling contractors. They used a fleet of ten new 3-batch Mack trucks equipped with Goodyear and Firestone tires and Heil hoists. The handling of the cement was also a subcontract. After the trucks had received their three batches they drove out from the batching plant and forward about 150 feet to the door of a freight car where five men loaded the six bags of cement per batch direct from the car. On the grade six men cut the bags and emptied them on the batches after the trucks had turned through a space in the forms and were ready to back to the pavers.

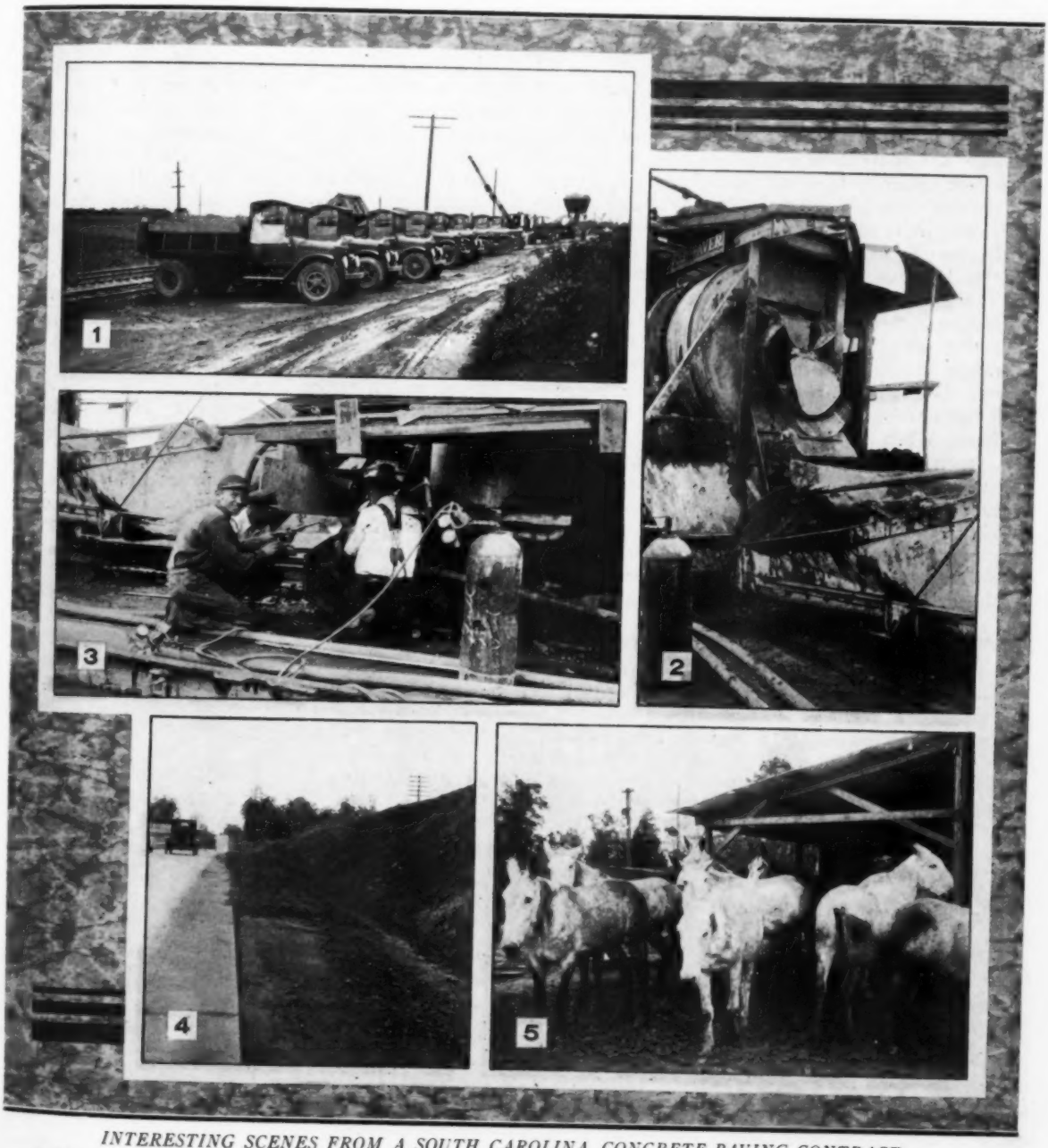
The subgrade of this job was a clay that cut up badly when wet from prolonged rain, but which dried out quickly and soon became dusty. In order to maintain a happy medium the grade was kept sprinkled from 500 to 600 feet ahead of the pavers and the same man who did this oiled the forms for a similar distance.

Running the Tandem Pavers

A pair of Rex 27-E pavers were run in tandem and produced about 1,200 feet of the 20-foot pavement in 12 working hours daily. The No. 1 paver was a newer model and a faster mixer than the other and was

set for a 47-second mix while the second mixed for 38 seconds. The shorter time for the second paver was necessary also because the heavy load of extremely dry concrete required under the state specifications would not run forward in the skip and hence the load was centered farther from the pivot of the skip than in normal operation and the lift was slower. The two mixer operators worked in very close harmony and with a device which they worked out to replace the regular rocker arm chute between the pavers they were able to increase the day's run by a full 50 batches.

The swing chute on the No. 1 paver was the same as is regularly furnished with a special Rex sub-chute about a foot longer than usual and made specially for tandem hook-ups. On the end of the sub-chute the operators attached a piece of S-ply rubber belting 12 inches wide and 26 inches long. The long way of the belt was set across the chute. This piece of belting was good for 4 miles of paving and then had to be replaced. In raising the skip of the No. 2 paver the back of the



INTERESTING SCENES FROM A SOUTH CAROLINA CONCRETE PAVING CONTRACT

1. The fleet of ten new 3-batch trucks just before the day's work started. 2. The ingenious arrangement of the skip with a back-board which was developed by the Superintendent and Concrete Foreman for the tandem pavers. 3. Making a repair to the paver treads on an off day. This was the first repair on the paver which had poured 60 miles of slab. 4. Shoulder preparation in the foreground with the backfill placed in the background. 5. Some of the four-footed workers which hauled the scrapers on shoulder excavation.

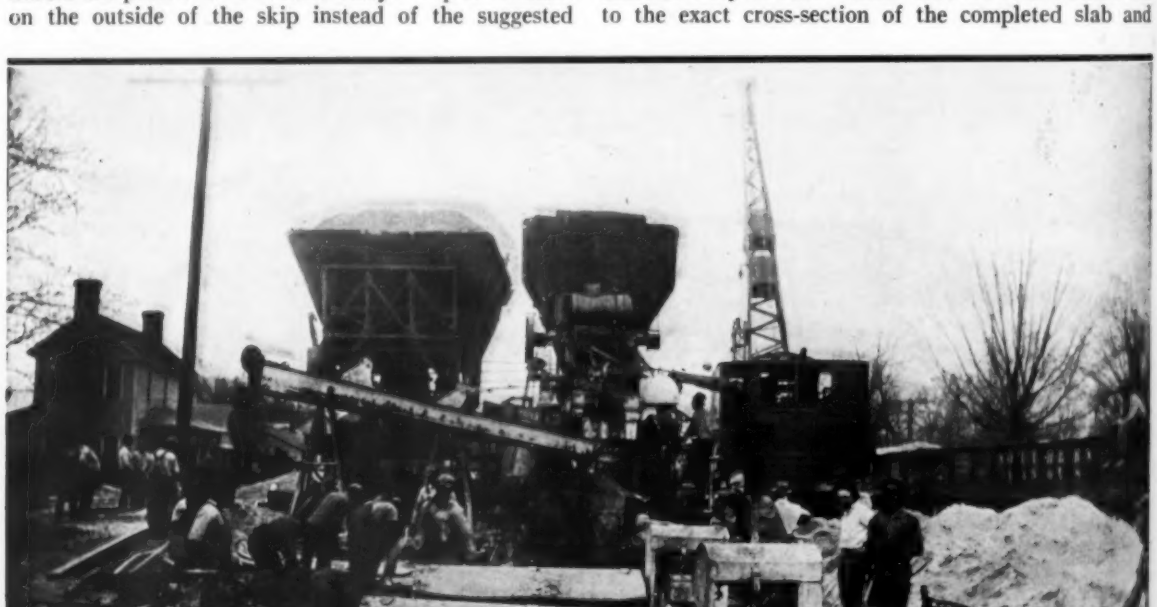
skip which had been built up in a special manner just hit the belt, and the same as it dropped.

The special back plate for the skip of No. 2 paver was necessary on this work with the ¾-inch slump of the concrete which did not permit it to flow forward in the skip. One of the illustrations shows the shape of this back piece with the center section made higher for the width of the belting. In order to hold the back plate, which was made of ⅛-inch plate, in place with the load of dry concrete against it, two pipe supports riveted to the plate and the covered section of the skip were used. These were supplemented by two strap iron braces to strengthen the plate across the back and were turned and riveted to the side of the skip. This entire outfit made on the job to permit the usual speed with the dry mix concrete was built at a cost of not exceeding $15.00. It was suggested by the concrete foreman that under these operating conditions it would have been better to have cut the skip of No. 2 paver about 2 feet short so as to place the concrete nearer the center of gravity of the skip, but this was not thought feasible as the paver would be shipped out of the state to other work as soon as this contract was completed and it would have been too costly to have welded the old section back onto the skip.

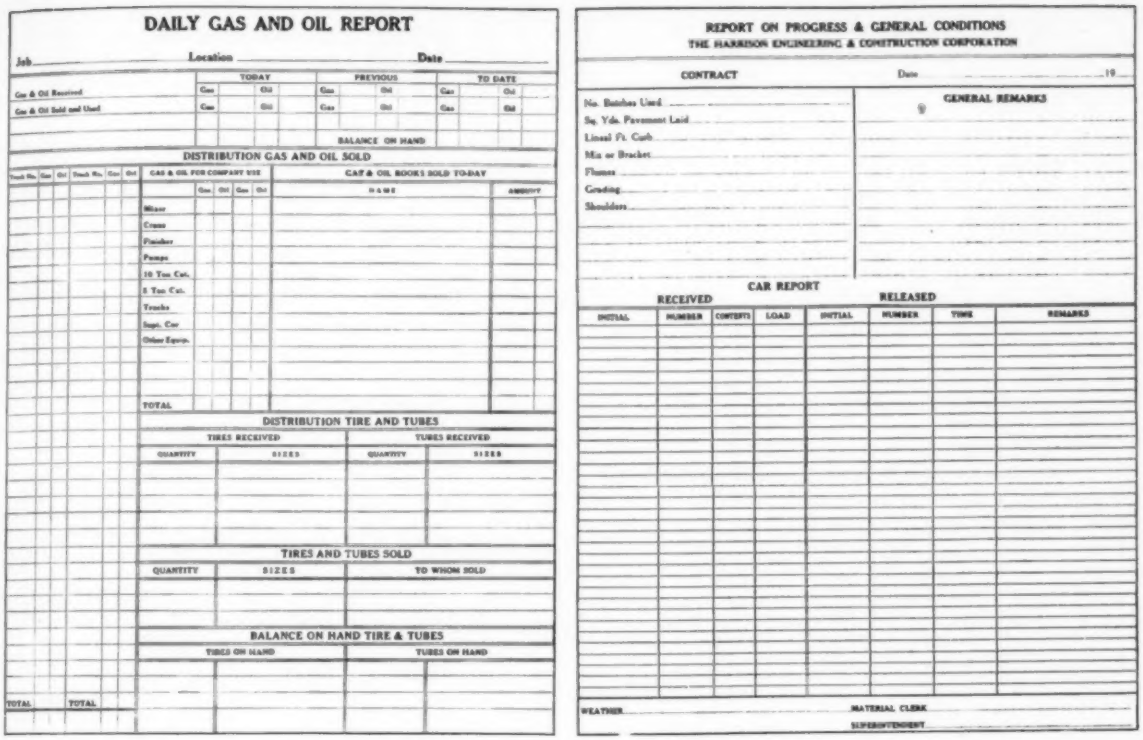
Another idea that the operators had under consideration had to do with the moving of the tandem pavers. The skip of No. 2 paver rode on the connecting I-beam which kept the pavers properly spaced at all times. When the skip was dropped it was gradually bent around the I-beam in spite of the heavy channel iron which was used regularly as a stiffener across the I-beam. They hoped to equip the No. 2 skip with wide wheels at the outside of the skip so that when it is dropped it will not be racked and will at the same time enable the pavers to be moved easily. A pair of skids on the outside of the skip instead of the suggested wheels might do the trick if they did not hinder the moving of the tandem.

One man handled the dumping of the batches into the skip of No. 1 paver and one man was kept constantly alert between the two pavers to watch for any piling up of the dry concrete in the swing chute, the sub-chute or above the back plate of No. 2 skip. He had a hoe for quick manipulation of the concrete. The second paver carried a Carr trail-grader with two men to shovel the excess dirt away. Following this was the South Carolina grade board which is not used in a similar form in any other state. It is a heavy wooden timber shod with iron and with pipe handles at either end and also rods for handles on the side toward the paver for assistance in pulling it back and forth until the subgrade shows an exact crown. It was pulled back and forth by the four husky laborers as much as eight or ten times to insure accuracy. The length of movement of the grade board was not more than 10 feet as any one pull. Depending on the effect of the board on the grade, dirt was shoveled by the laborers onto the grade to make up any deficiency or the grade was "skinned" with shovels if high. The board was so heavy that it was practically impossible to pull it along the forms on the iron shoes that rested on the forms unless the grade was at least 1/16-inch low.

After the grade was entirely satisfactory it was sprayed with a garden hose nozzle set for a fine spray and controlled with a regular spigot. If the thickened slab was being poured at the time, the Truscon center steel was set after the spraying of the grade. It was 6¼ inches high and set by two men who also placed the 4-foot dowels an average of 5 feet on centers through the steel. The dowels were ½-inch deformed bars. The same men set the expansion joints of ½-inch Elastite every 40 feet. These were set with a shield cut to the exact cross-section of the completed slab and



The Batching Plant Set-Up at Landrum with the Plant Moved Off the Grade to Permit the Pavers to Pass



DAILY GAS AND OIL REPORT

Job _____ Location _____ Date _____

	TODAY		PREVIOUS		TO DATE	
	Gas	Oil	Gas	Oil	Gas	Oil
Gas & Oil Received						
Gas & Oil Sold and Used						
			BALANCE ON HAND			

DISTRIBUTION GAS AND OIL SOLD

Truck No.	Gas	Oil	Truck No.	Gas	Oil

GAS & OIL FOR COMPANY USE				CAT & OIL BOOKS SOLD TO-DAY	
	Gas	Oil	Gas	Oil	NAME	AMOUNT
Mixer						
Crane						
Finisher						
Pumps						
10 Ton Cat.						
5 Ton Cat.						
Trucks						
Supt. Car						
Other Equip.						
TOTAL						

DISTRIBUTION TIRE AND TUBES

TIRES RECEIVED		TUBES RECEIVED	
QUANTITY	SIZES	QUANTITY	SIZES

TIRES AND TUBES SOLD

QUANTITY	SIZES	TO WHOM SOLD

BALANCE ON HAND TIRE & TUBES

TIRES ON HAND		TUBES ON HAND	

TOTAL TOTAL

REPORT ON PROGRESS & GENERAL CONDITIONS
THE HARRISON ENGINEERING & CONSTRUCTION CORPORATION

CONTRACT Date _____ 19__

No. Batches Used _____
Sq. Yds. Pavement Laid _____
Lineal Ft. Curb _____
Mix or Bracket _____
Planes _____
Grading _____
Shoulders _____

GENERAL REMARKS

CAR REPORT

RECEIVED				RELEASED			
INITIAL	NUMBER	CONTENTS	LOAD	INITIAL	NUMBER	TIME	REMARKS

THE HARRISON ENGINEERING & CONST. CORP.

DAILY COST REPORT

CONTRACT_____ DATE_____ 19___

LABOR COST

ITEM	TODAY	PREVIOUS	TO DATE	No. Men	REMARKS
1 Setting up					
2 Unload and Load					
3 Handling Cement					
4 Hauling					
5 Paving					
6 Curing					
7 Forms					
8 Fine Grade					
9 Rough Grade					
10 Culverts					
11 Water					
12 Watchman					
13 Supt. and Timekeeper					
14 Equipment Repairs					
15 Force Account					
16 Shoulders					
Total Labor					
Sq. Yds. Paving					
Cost Sq. Yd. Paving					

WORK COMPLETED

ITEM	TODAY	PREVIOUS	TO DATE	REMARKS
Excavation Cu. Yds.				
Curbing Lin. Ft.				
Gutter " "				
Class A Conc. Cu. Yds.				
Paving Lin. Ft.				

BATCHES

TODAY	PREVIOUS	TO DATE	BRACKET	REMARKS

The Analysis of Costs Which Was Forwarded from the Job to the Main Office Daily

CURING

As soon as the water had left the top of the slab so that the burlap would not stick to the concrete the strips of burlap were spread by two men from a rolling bridge with up-turned ends. These were built in this manner originally so as to miss the wheels and still give a full-width bridge. It had the added advantage of placing the ends of the burlap at an easier elevation for the men to pick up. The burlap measured 21 x 4 feet for individual pieces. The burlap was wet down either before being placed on the bridge or as soon as placed thereon. Two other men sprinkled the burlap for the remainder of the day. The following morning the burlap was picked up by the two burlap men and carried forward. They were assisted in this work by the two joint men who were not busy for the first two hours on their regular work. One of the sprinklers sealed the tops of the expansion joints with cut-back asphalt to prevent water and dirt getting between the joint material and the concrete.

The next operation was the final checking of the top of the slab by the inspector with the wooden straight-edge. The pavement was then rubbed with a carborundum brick to a smooth finish where any high spots showed. It is to the credit of the contractor and his finishers that one carborundum brick that started the job was still in very good shape for other jobs at the close of the work.

Immediately upon the completion of the straight-edging the subcontractor who handled the curing spread over a very light covering of earth to protect the concrete from too rapid drying and then his men went back at once and began the placing of the 2-inch earth cover which was sprinkled for 8 days. This subcontractor also pulled the forms and hauled them ahead.

WATER SUPPLIES

Water for various operations was taken from creeks along the right of way and pumped by two C. H. & E. No. 11 triplex pumps and a Jaeger pump through 2½-inch pipe laid along the shoulders. The taps for the various hose connections were placed every 240 feet. The paver carried 200 feet of Goodyear heavy-duty 1½-inch paver hose. There were ten 1-inch sprinkler hose along the work for the various sprinkling operations and these made it necessary to keep the three pumps going during the time that the paver was operating so that there would be a sufficient pressure at the paver.

COMPLETING THE SHOULDERS

Special treatment of the shoulders is required in South Carolina. They are cut to 4 inches below the grade of the slab for a width of 5 feet in cuts and 6 feet in fills and a 4-inch windrow of dirt left at the outer edge to

(*Continued on page 26*)

The Harrison Engineering & Construction Corp.
(Of Delaware)
903 FAIRFAX BUILDING, KANSAS CITY, MISSOURI

Efficiency Check _____ 193__

Daily Report

Delays:

1 _____ Time _____
2 _____ " _____
3 _____ " _____
4 _____ " _____
5 _____ " _____
6 _____ " _____
7 _____ " _____
8 _____ " _____
9 _____ " _____
10 _____ " _____
11 _____ " _____
12 _____ " _____
13 _____ " _____
14 _____ " _____
15 _____ " _____

Starting Time Of Mixer. Stopping Time Of Mixer

Causes:

1 Water Pump
2 Trucks
3 Inspector
4 Forms Not Straight
5 Mixer No 1
6 Mixer No 2
7 Finishers Cement
8 Short _____ Sand
9 Weather Gravel
10 Pipe Line
11 Out of Gas
12 Grade Not Right
13 Hose Busted
14 Bins Out Order
15 Engine Trouble
16 Finishing Machine No 1
17 Batches
18 Curing
19 Water Valve Out Order On Mixer
20 Grade Board
21 Finishing Machine No 2
22 Mixer Engine Out Of Order
23 Crane Out Order
24 Dry Mixing
25 Batches Lost
26 Expansion Joint
27 Culvert Steel
28 Center Steel
29 Dinner
30 Steel Bars
31 Batch Water
32 Bar Supporters
33 Head Engineer
34 _____
35 _____
36 _____
37 _____
38 _____

Remarks:

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____

No Start Sax. Stop Batches Ft. %

Thin _____

Thick _____

The Daily Efficiency Report Blank of the Harrison Engineering & Construction Corp.

Widening Bridges *on an* Old Federal Aid Project

Large Cuts and Borrow with Novel Methods of Widening Old Bridges on J. A. & H. E. Pigford Contract Near Meridian, Miss.

OFFICIALLY known as Federal Aid Project 135, Reopened, the contract of J. A. & H. E. Pigford of Russell, Miss., on U. S. Route 11, south of Meridian, Miss., provides an interesting study of ways of beating that famous devil around the bush when it comes to widening existing steel and concrete bridges. There was some bad excavation that was interesting, too, and long hauls to fill from borrow pits. The work included five bridges which were widened from 18 to 23 feet.

Widening a Typical Steel Bridge

The steel truss bridge over Oktibee Creek which had an 80-foot span will serve as a fine example of the methods used for widening this kind of structure. The old bridge had an 18-foot roadway supported by two low trusses. The first operation was the placing of falsework under the entire structure, using local timber as piling. The entire bridge was then jacked up with four 50-ton hydraulic jacks borrowed from the railroad. The entire structure was raised a total of 7 inches. The floor system was then blocked up with 10 x 10-inch and 12 x 12-inch beams and the floor beam connections cut away with oxy-acetylene torches and cold cutting to retain the old floor system and to release the trusses which were dismantled by cutting the field connections. These were shipped away to be used on a secondary road.

Then an 81-foot steel plate girder 47 inches deep was set on each side of the floor system on the same piers and connected to the old floor system. The connections on the new girders were made 7 inches higher than they would have been, as the floor had been jacked up that amount. The steel girders thus carried the original floor intact for its full width of 18 feet. The floor of the bridge was widened by cantilevering the widening strip on either side out over the girder and carrying the new hand rail. The plate girders were furnished by the Virginia Bridge & Iron Co. from its Birmingham, Ala., plant.

The reason for jacking the bridge up 7 inches and leaving it at that elevation was to permit the addition of a 7-inch slab of reinforced concrete to be laid on the approaches the new full width of 23 feet. On the original bridge floor and also on the approaches the top surface of Kyrock was removed and salvaged for use elsewhere. On the approaches the old hand rail and curb were knocked off. The reinforcing steel of the hand rail was saved as it was imbedded in the base and made an excellent bond between the old and new concrete on the cantilevered section. The cantilevered section had a 2-foot overhang which during construction was carried on a row of piles driven alongside the

The New Widened Structure at Hog Nose Creek, Showing the Old and New Concrete in the Pier

old structure. The piles carried a continuous cap of 6 x 8-inch lumber on which the forms of 6-inch shiplap backed with 2 x 4's on 18-inch centers rested.

An old double-drum hoist powered with a Novo engine and mounted on skids was used to drive all the piling and handled the sections of the truss as it was dismantled. The concrete for the widening strips was mixed in a Jaeger 1-bag mixer in the same manner as described for the concrete crew on the concrete bridge following.

WIDENING A CONCRETE BRIDGE

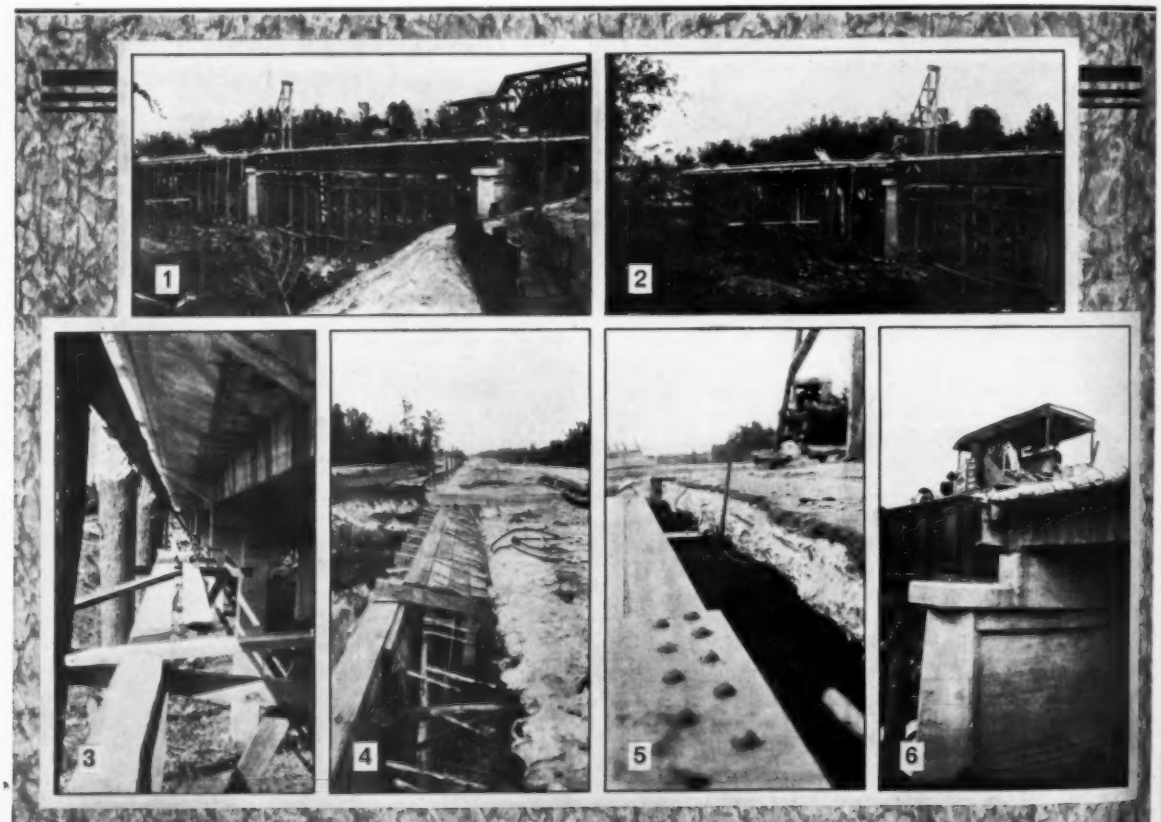
The work at Hog Nose Creek Bridge was typical of the work on the concrete bridges on this project. The creek was excavated to the old footings with hand labor and the footings and piers extended to take care of the added load. Hog Nose Creek bridge had five spans of 26 feet clear with a concrete girder and deck. After the footings and piers and columns were poured, the old curbs and hand rails were removed and the structure was widened 6 feet on each side by the addition of a girder and curb on either side. Then the floor was poured up to the elevation of the old floor. The concluding part of the bridge contract required the pouring of a 6-inch paving slab over the top of the old and new parts of the structure. The old deck of the bridge had a 6-inch ballast of gravel on a rough concrete deck slab. In setting up the forms for the widening strip the contractor made a 6-inch offset or extra curb which gave him a narrow shelf from which to screed the paving slab accurately and smoothly. This will be noted in one of the illustrations.

THE CONCRETING CREW

The illustrations taken on Windy's Bridge show the method of concreting the structure. The concreting crew which went from one bridge to the next, following the carpenters as soon as the forms were completed, consisted of three men with wheelbarrows on sand and gravel, a mixer man for the Jaeger 1-bag mixer, one concrete buggy man, two shovelers and two spaders on the concrete. As there was no water line along the work a small single-action hand pump was used and one man pumped continuously during the mixing to furnish the water for the mixer.

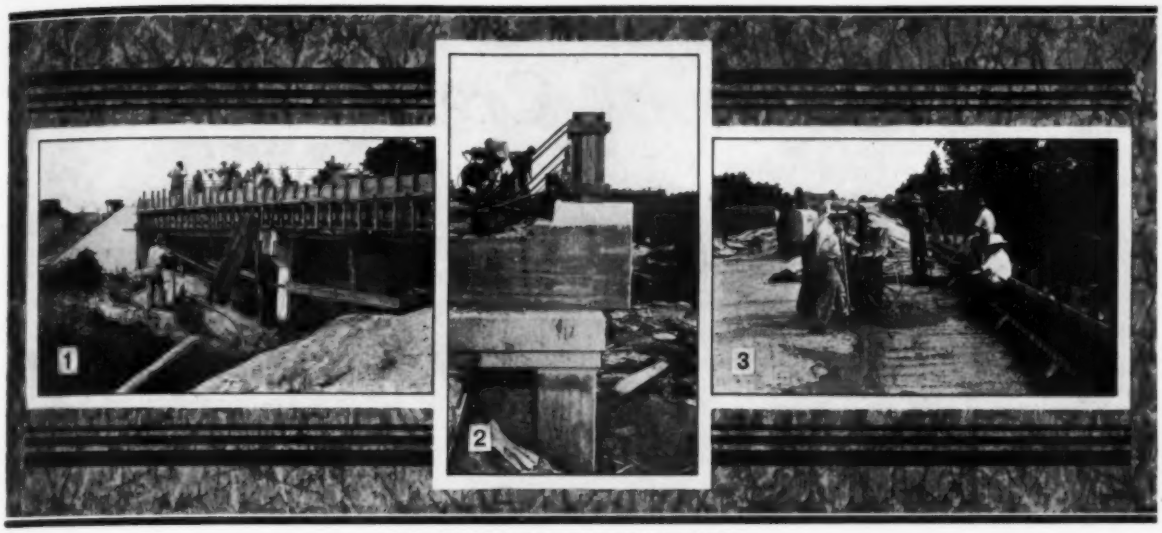
THE BIG CUTS AND BORROW

One of the largest borrow pits for the entire job was



METHODS USED IN WIDENING THE STEEL BRIDGE OVER OKTIBEE CREEK AND THE CONCRETE APPROACH

1. A general view of the girder section showing the false work from which the slab and floor beams were jacked. 2. The approach substructure showing the piles to support the cantilevered widening slab. 3. View beneath the floor slab showing the piling with 6 x 8-inch cap and a completed cantilever section. 4. Forms for the cantilevered section shown resting on the 6 x 8-inch cap. The old reinforcing is shown ready to be embedded in the new concrete. 5. A close-up of the slab showing the old 6-inch rock asphalt top and concrete slab carried on the original floor beams, all of which were raised 7 inches and the beams connected to the new girder. 6. A detail of the end of the new girder showing the edge of the concrete slab and black top and the approach slab.



WIDENING CONCRETE BRIDGES

1. This bridge was widened entirely on one side as will be seen by comparing the widths of the columns. Note the one-man pump for water for the concrete. 2. The end of a widened bridge showing the new column of the abutments, the new curb which has already been rubbed and shows white, and the 6-inch paving off-set from which the new roadway slab was screeded. 3. The concreting crew at work. Pictures 1 and 3 are of Windy's Creek Bridge and the other of Hog Nose Creek Bridge.

in Rosenbaum's Hill from which 50,000 yards of earth was excavated and hauled a maximum of 3,000 feet by trucks. A Mead-Morrison ⅝-yard gas shovel loaded from the hill in seven lifts to the fleet of four 3-yard International trucks. As there was a mixture of material in the hill which included a sandy loam, clay, marl and even small pockets of pure white sand the trucks were often caught in deposits of clay at the dump and had to be pulled out. That this was not the fault of the trucks and not entirely due to errors in judgment on the part of the truck drivers is shown by the fact that they were sometimes caught as much as 5 feet from the edge of the fill in pockets of clay that had not become compacted and which had been fairly damp when dumped.

From one large cut a total of 60,000 yards of earth and rock was excavated. The maximum depth of the cut was 63 feet. This was handled by a Northwest 1¼-yard shovel. The top 18 feet of the cut was rock which had to be drilled and blasted, yet when exposed to the air for a week or two became flaky so that it could be readily broken up with the hands.

Another cut 20 feet deep just about ¼-mile south of this proved to be the worst cut on the job. The material was so bad in places that it could not be used for fill and had to be wasted. The 18-foot rock stratum at the top was drilled in 6-foot lifts and shot with 40 and 60 per cent Hercules dynamite and black powder. A Mead-Morrison ⅝-yard gas shovel was used to load the five light trucks. A total of 13,000 yards of rock was removed from this cut. The excavation was carried 1½ feet below grade and the roadway backfilled with acceptable material.

In this particular rock cut the contractor was greatly troubled with tire blow-outs in the dual pneumatics. The stones would become wedged between the two tires and when a rock was hit it cut right into the tire on one side or the other and that was the end of the tire. In one month he spent $200 for new tires alone. He tried running the tires hard and then tried them soft and the latter condition seemed to prove better, but the best of the lot was running one of the trucks with four flats in the rear. It ran very satisfactorily for over a month until some new tires arrived to fit it.

QUANTITIES AND UNIT PRICES

ROADWAY ITEMS

Clearing and grubbing		$960.00
Common excavation	48,010 cubic yards	.192
Borrow excavation	111,739 cubic yards	.192
Rock excavation	1,500 cubic yards	1.00
18-inch DSVC culvert pipe	267 feet	1.40
24-inch DSVC culvert pipe	6 feet	2.77
Class A concrete, 1:2:4	143 cubic yards	16.00
Class C concrete, 1:3:6	20 cubic yards	15.00
Reinforcing steel	14,244 pounds	.032
Bermuda sodding	4.42 miles	100.00
R. O. W. markers	920 units	1.25

BRIDGE ITEMS

Class D concrete, 1:2:3	683 cubic yards	18.00
Reinforcing steel	85,471 pounds	.03
Concrete railing	1,420 lineal feet	1.30
Concrete paving	1,073.3 square yards	1.98
Structural steel	63,160 pounds	.0395
Creosoted piling	540 linear feet	.75
Untreated piling for foundations	1,500 linear feet	.20
Creosoted lumber	13,000 feet BM	60.00
Rip rap	75 cubic yards	7.50
Removing existing trusses and falsework	1 unit	1,290.00
Total for roadway items		$37,131.16
Total for bridge items		$24,655.05
Total for contract		$61,786.21

PERSONNEL

This contract for the widening and relocation of a section of U. S. Route 11 south of Meridian, Miss., was awarded to J. A. & H. E. Pigford of Russell, Miss., for $61,786.21. For the contractor, W. R. Stricklin was in charge of the bridge work and H. E. Pigford for the roadway work. For the Mississippi State Highway Department, J. B. Craig was Resident Engineer.

Paving with Truck Mixers

B. Perini & Sons recently completed a truck-mixed concrete paving job on Long Island, N. Y., which will be described in the April issue of CONTRACTORS AND ENGINEERS MONTHLY.

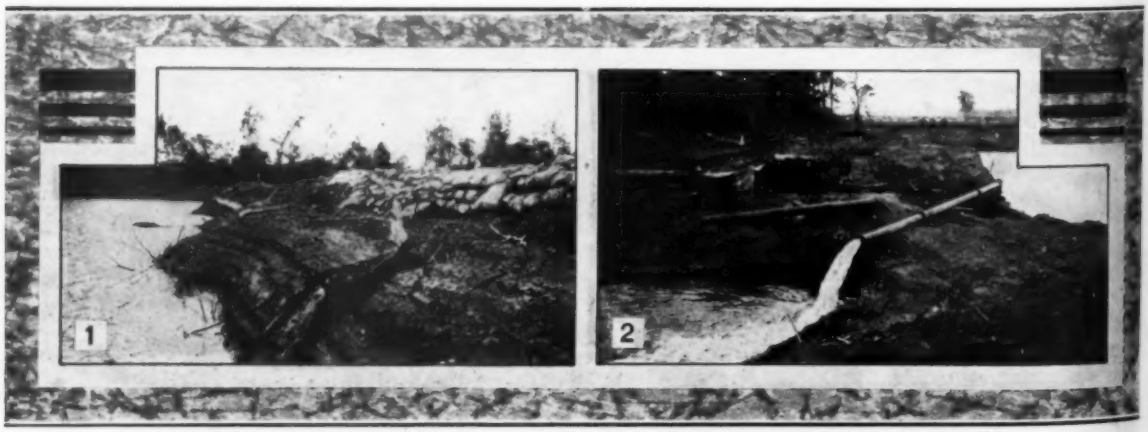
Crawler Wagons *on* Levee Enlargement

THE 30-year-old story of the railroad section foreman who reported an oft recurring accident to old No. 12 in the terse and accurate words "Off again, on again, gone again, Lonergan" might well be used to report the opportunities that levee contractors have to work through the winter, as the ups and downs of Old Man River make water literally "off again, on again, gone again." C. C. Aderholdt was awarded a 1¼-mile "item" or, in anything but government parlance, a contract, for enlarging a section of levee near Sherard, Miss. This involved handling about 620,000 yards of dirt from riverside pits. Work was started August 28, 1931, with a crawler wagon outfit and was closed down by high water from January 1, 1932, to March 27 when the work was started up again only to be closed from April 9 to May 4. Then with the water receding so that the higher ground would support the crawler wagons and the use of pumps to dewater the pits so that the pits themselves would finally support the draglines, the work was pushed actively.

The riverside pits of any levee are usually basins for the retention of water at all but the driest seasons. When a contractor wishes to put his draglines into them to secure further borrow he must first drain them with pumps. On this contract the large riverside pit was divided into two parts of about equal size by a protection levee and two centrifugal pumps installed to pump the water over the dike or protection levee from the one close to the area that was to be extended as a borrow pit. These pumps worked steadily day and night to lower the water level which was about 6 feet above the bottom of the pit. One of the pumps was a Cameron centrifugal with a 6-inch suction and a 4-inch discharge driven by a McCormick-Deering tractor and belt. The other was a smaller centrifugal driven through a Ford gear shift by a Ford engine removed from a chassis and placed in a timber cradle.

Stripping with an Elevating Grader

After the ground was sufficiently firm for the operation of the tractors and crawler wagons, the first operation was the removal of all stumps for 300 feet ahead of the work by pulling with tractors or, in the case of the larger stumps, by blasting out of the ground. Then the top soil was stripped with a Caterpillar elevating grader with a 40-inch belt pulled by one or two Caterpillar Sixties as the ground condition warranted. Where the ground was soft it was necessary to keep the two tractors pulling as the elevating grader mired at the turns and it was more economical to keep the two tractors hitched to the grader than to hold one in reserve



THE RIVER-SIDE PITS ON A LEVEE CONTRACT AT SHERARD, MISS.

1. *A section of the protection levee between two of the pits, showing the sand bags placed there to protect one pit during high water.* 2. *A 4-inch centrifugal pump, belt-driven by a tractor, unwatering one of the pits.*

C. C. Aderholdt of Memphis Used Crawler Wagons, Elevating Grader and Draglines

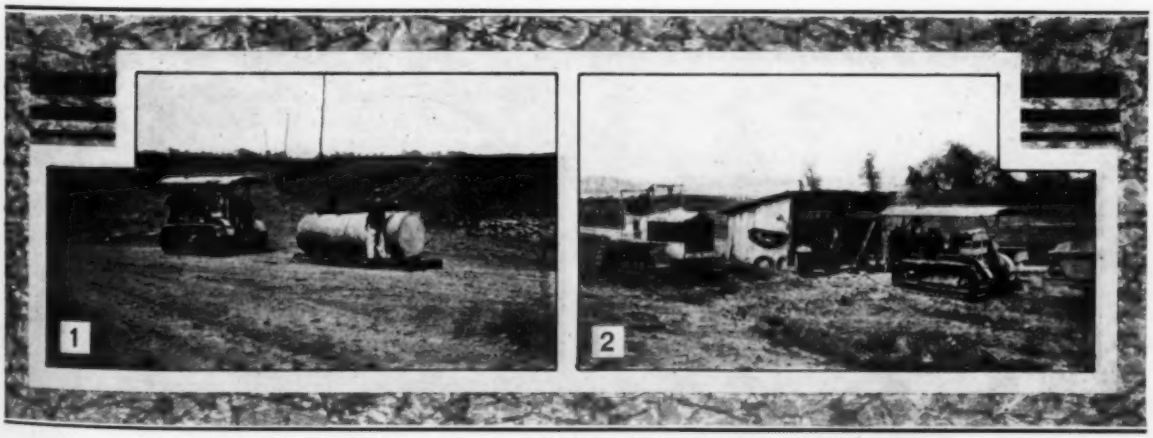
as a "snatch team." When the top surface was stripped and hauled to the levee, and the pit was dry enough two Northwest No. 60 draglines with 35-foot booms and 1½-yard Page buckets were put on to load to the crawler wagons. Where the haul was short and dirt was being placed in the base, the elevating grader and the two draglines were used, making possible the placing of 4,000 yards of earth in the enlarged levee section on each 11-hour shift.

The Crawler Outfit

The crawler wagon outfit consisted of four 8-yard Euclid wagons, five 5-yard Western wagons and with Athey truss wheel crawlers, and five 7-yard Streich wagons. These were hauled by ten Caterpillar Sixties and a Cletrac 60-80. The Sixties used about 60 gallons of gasoline per shift in this work, running up grade to the top of the levee section.

For dressing on the dump and for the landside cut-down a Caterpillar Sixty with a LaPlant-Choate hydraulic bulldozer was used. The landside cut-down is a term which needs a little explanation. The old levee section had a banquette or bench which started about halfway down the landside slope and the slope of the old levee above the banquette was steeper than that of the new levee. The new levee slope terminated at the inside edge of the crown of the banquette. From this point landward the old levee was not to be disturbed. Thus there was a section of earth above the new slope that had to be cut off and carried up to the new fill on the riverside of the levee.

Each crawler wagon and tractor had a winder and a driver. The winders rode the wagons up the slope to the dump, tripped the bottom dump doors when directed by the spotter and then did their work of winding the doors shut again. They usually dropped off the wagons at the foot of the slope and gathered like flies about the water barrel "restin'" until their wagons returned. Four men on the dump picked roots which when more than 1½-inch in diameter must be removed. There were also a foreman for the pit and another for the dump, each mounted on a fine horse, a sight not seen on levee work now as frequently as in the old days when all the motive power was furnished by mules. There was a blacksmith and a helper who kept the tractors and crawlers in condition and two greasers. Every piece of equipment was greased once a day. A grease wagon or skid with all the drums of grease and the guns on it was kept in the pit ahead of the work so that it was close by when there was an opportunity to grease at odd times to relieve the rush when the daily greasing time came.



METHODS USED BY C. C. ADERHOLDT FOR SERVICING EQUIPMENT

1. *Moving one of the 1,000-gallon gasoline tanks which was mounted on skids.* 2. *The repair shed, also mounted on skids, was kept in the borrow ahead of the work and was equipped with a portable electric plant.*

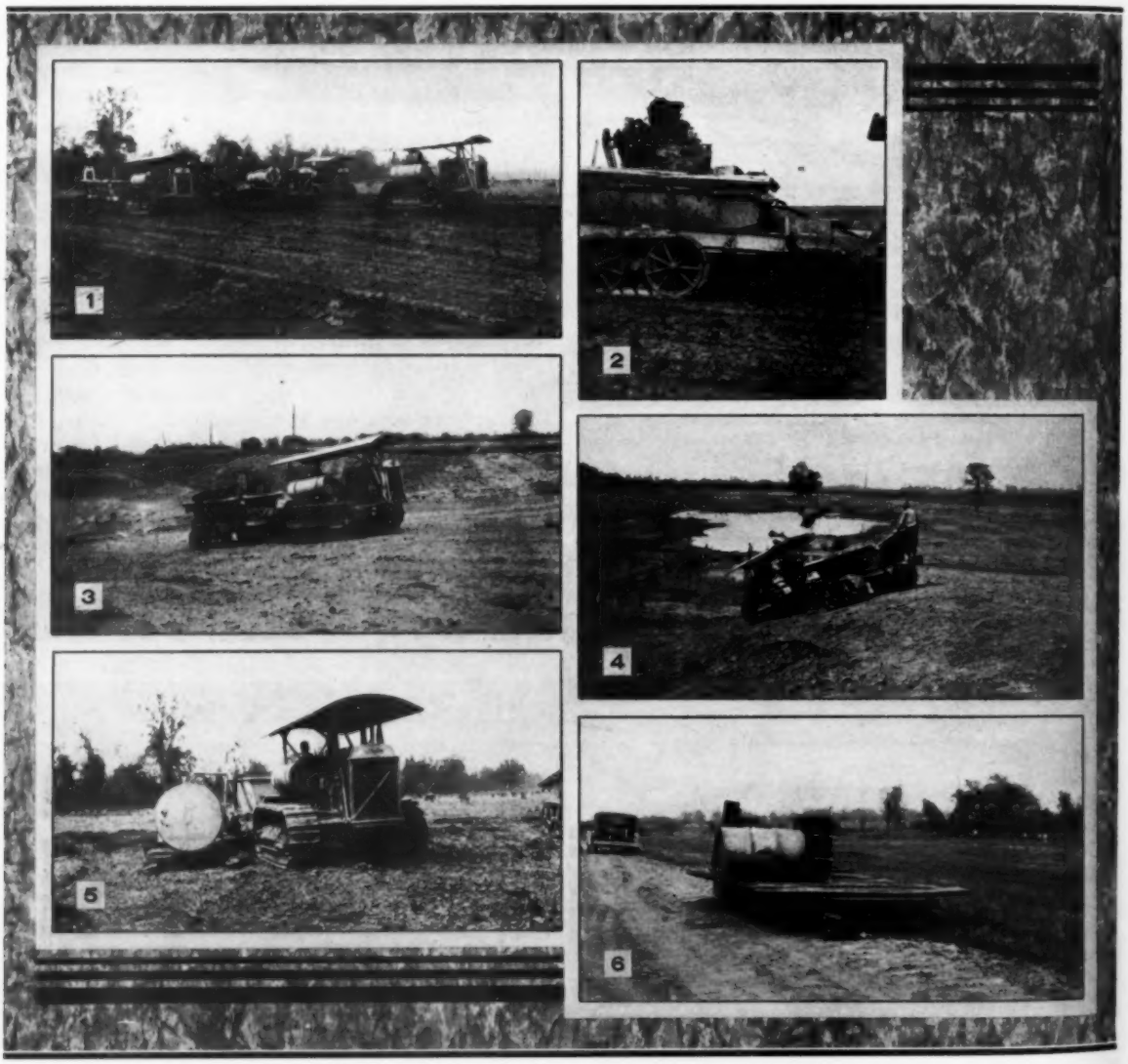
A tool shed mounted on skids was also kept in the borrow ahead of the work so as to be close to the machines in case of emergency work. It was equipped with a Delco 110-volt 4-cylinder light plant which also furnished power for electric drills and grinders.

MISCELLANEOUS EQUIPMENT

Before the bulldozer arrived on the job and became the jack-of-all-trades in dressing and trimming, various pieces of equipment were used for this purpose. A Western wheeled scraper, an Adams grader and a larger Austin-Western grader were used for this work at various times. It is interesting to see a tool which has been an indispensible piece of equipment on highway work for so long just finding its way into the levee field where dirt is moved in such great quantities. Anything less than half a million yards of dirt is not much of a contract in levee work and that would be an all-star affair on a road job. The graders were used to maintain the runs for the tractors and wagons coming up onto the levee. A long comparatively low grade was used for the heavy up-haul and a steep grade for the empty return trip.

It is reported that there is not a single all-mule team outfit working on the Mississippi River today, except team outfits making rain and wave wash repairs, as the machine hauling of dirt has put them out of business. It can also be said that there are very few outfits working on the river that have not one or two mules handling the odd jobs that need more than man-power and not as much as machine power for their accomplishment. On this Aderholdt job there were six mules which were used to pull the plows for breaking the sod surface of the old levee before the new material was added, and also in the wagon that hauled the water for

(Continued on page 26)



MAKING THE DIRT "ROLL" WITH CRAWLER EQUIPMENT

1. Stripping a borrow pit with an elevating grader. 2. The projectory of the elevating grader. 3. Hauling a load up the riverside slope of the levee. 4. Taking a short cut back to the pit while the winder does his work. 5. Taking on a load of gas in the borrow pit. 6. The greasing sled carried drums of various lubricants and the special gun for the tractors.

From

Stream Bed

to

Surfaced Road

R. G. Lassiter & Co.,

Raleigh, N. C.,

Built 4 Miles of

20-foot Gravel Road

Near Elkton, Va.

CERTAIN sections of the old Dominion State, Virginia, are blessed with streams which through the centuries have built up large deposits of gravel along the banks. The Virginia Department of Highways has made use of these deposits in creating the bases of its rapidly growing hard surfaced state highway system. Contracts are awarded for excavation, hauling, placing and rolling of these gravel bases up to 10 inches thick and then, when they are properly consolidated, the State Highway forces place an asphalt top on them. R. G. Lassiter & Co., Raleigh, N. C., was awarded a 3.838-mile contract at Elkton, Va., for a gravel base 20 feet wide and 10 inches thick compacted. Work on this job started on February 1, 1932, with a Lorain 60 gas shovel with a ⅞-yard bucket on the excavation, which amounted to about 40,000 yards. The subgrading was handled by a Caterpillar Thirty with a 9-foot Adams leaning wheel grader and a team and fresno for trimming up. For pulling down the surface a Galion multiple-blade maintainer was used and an Austin 10-ton gas roller was placed on the job for compacting the fills where necessary.

It is part of the Virginia specifications that all sections of a road which are to remain at grade but which are to be graveled must be scarified prior to the placing of the gravel. For this purpose the contractor used a Lakewood scarifier pulled by the tractor. The labor organization was particularly small on grading, being only three laborers, two on the dump and one on slope.

Loading the Gravel

On some Virginia projects it is possible for the contractor to load direct from a gravel bank at the side of a stream or from the stream bed itself to the trucks which haul the material to the grade. The bed of the south fork of the Shenandoah River which was used by this contractor as the source of gravel is filled with many cobbles or oversize stones. Because of this it was necessary to use some method of screening the gravel before it was hauled to the road. After experimenting with a bucket loader which did not prove successful, a wooden bin was built at such a height that the hauling truck could back under it for loading. Then a ramp was built from ground level to the top of the bin up which two shuttle trucks backed and dumped their loads onto a grizzly made of scrap iron with rods and pipe spacers.

The Lorain 60-A shovel with an 84-horsepower Waukesha motor worked along the edge of the stream against a 4-foot face and loaded the two shuttle trucks at varying distances up to 800 feet from the bin. In addition to the shovel operator an oiler was on duty at

The Loading Bin Where Oversize Cobbles Were Removed by a Grizzly, Showing the Ramp for the Shuttle Trucks, One of Which Is Just Dumping, and the Horse-Drawn Wagon for Hauling Away the Oversize Stone

the shovel. At the wood bins there were three men on top at the grizzly to see that the material flowed through quickly into the loading bin and that the larger stones dropped off to the side where they were loaded on to a farm wagon and hauled away. The size of the stones would have turned the eyes of rock garden enthusiasts green with envy, but there were no takers so the stone was wasted.

One man below the bin operated the gate with a long lever so that it was only a matter of the trucks driving under, opening the gate until the truck was filled, closing it and waiting the arrival of the eleven hauling trucks which were furnished by A. G. Boone of Columbia, S. C., one of the leading hauling contractors of the southeast.

PLACING THE GRAVEL

On the road two men dumped the trucks and did such hand trimming as was necessary, following which the grader and roller completed the spreading and compacting of the 10-inch gravel base course.

PERSONNEL

This 3.838-mile gravel contract was awarded to R. G. Lassiter & Co., Raleigh, N. C., as the low bidder, with R. L. Gillian as Superintendent. For the Virginia Department of Highways, J. B. Trimble was Resident Engineer.

Tandem Pavers on a 20.5-Mile Job in South Carolina

(Continued from page 18)

mark the limit of the cut. These shoulder excavations were made with ten mule teams and rotary and wheeled scrapers assisted by a Caterpillar Thirty grader pulled by a Thirty tractor. This prepared trench was backfilled with top soil from borrow along the right of way. Wherever possible top soil containing Bermuda grass roots was used, as this grass is very effective in preventing erosion. A Bay City Model R ¾-yard gas shovel loaded the soil from windrows thrown up by the grader, and it was hauled to the shoulder by six Ford and Chevrolet trucks. Six men and a Moritz shoulder machine were used to finish the shoulders, the men being used before the arrival of the machine.

ACCOUNTING

Through the courtesy of the Superintendent we are permitted to reproduce with this article a set of the forms used for reporting the work each day as the contract progressed. It is interesting to note that formerly the job carried a timekeeper and an accountant. But when the daily reports were sent to the home office from each job it was possible to do away with the accountant on all five jobs and one man did the entire work.

The handling of the gasoline and oil was reported on the daily report forms. Close to the batching plant where most of the mobile equipment was passing during the day the contractor maintained a 500-gallon gasoline tank furnished by the Sinclair distributor. From this tank the contractor's own trucks and the subcontractor's batch trucks were fueled and the individual sales slips turned into the field office. These were attached to the daily reports sent to the home office with proper identification for distribution to the various activities. The gasoline contractor drove a tank truck over the job several times a day and supplied fuel to all the machines operating on the grade and to the pumps.

The contract for the hauling of the batches was arranged on the same basis as the payment to the general contractor by the state, namely on a square yard basis and not by the batch as is becoming so general. Payment for all materials and services of subcontractors was made by checks from the home office of the contractor. Thus it was possible to deduct readily gas and oil sales to the subcontractor's trucks from his payment for batch hauling.

PERSONNEL

Work on this 20.5-mile contract was started on October 15, 1931, with an allowance of 175 working days. Paving work was discontinued because of the financial condition of the State from January 20 to March 1, 1932. Paving was completed on June 28, 1932. The contractor was the Harrison Engineering & Construction Corp. of Kansas City, Mo., for which A. P. Little was Superintendent. For the State Highway Department R. P. Berry was Resident Engineer.

Crawler Wagons on Levee Enlargement

(Continued from page 24)

the job, both drinking and for the tractors. They also hauled the gasoline to the draglines.

The contractor had two 1,000-gallon gasoline tanks mounted on skids and equipped with pumps which were spotted at convenient points for the tractors to reach them with the minimum amount of lost motion. These tanks were filled several times a day by the Texas Company tank wagon so as to maintain a constant supply of gasoline on the job. They provided a reserve supply for night operation.

PERSONNEL

The contract for this item of 620,000 yards of levee enlargement was awarded to C. C. Aderholdt of Memphis, Tenn., for 26.13 cents a yard. H. B. Aderholdt was Foreman on the dump and M. F. Sigmon was Foreman at the pit and draglines. This work was done under the direction of Major Brehon Somervell, District Engineer of the Memphis District, with the Third Field Area Office of Helena, Ark., under Senior Engineer H. V. Pittman, in charge of the field inspection.

Simplified Practice Recommendation on Wheelbarrows

THE revised simplified practice recommendation R105-32 for wheelbarrows has recently been published and can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents a copy. The original recommendation as formulated by the industry contained 41 sizes and types of wheelbarrows. In the revised schedule this number has been reduced to 27. Designation numbers have also been given the wheelbarrows listed in the revision program and it is expected that the use of this uniform terminology by manufacturers will prevent confusion in the mind of the customer.

Cleaning A River Channel

Rehandling Material Excavated Under Water

Ward-Hayes Construction Co. Removed 500,000 Yards of Sand and Gravel from Great Miami River through City of Hamilton, Ohio

FLOODS which caused a great loss of life and damage to property swept down the Miami Valley in southwestern Ohio in 1913. The cities of Hamilton and Dayton bore the burden of this disaster. Following this, the Miami Conservancy District was organized and built a system of retarding dams and levees and also cleaned out and straightened the channel of the river. This original work was substantially completed in 1922. In spite of the excellence of the work, considerable building up of the river channels has occurred in the last eleven years. Although this had been anticipated and a fund provided for the removal of such material, these deposits of sand and gravel have materially reduced the capacities of the stream channels so that in the event of a controlled flow equal to the maximum permitted by the control works at the five dams, the water might rise to dangerous heights.

A contract was awarded in the spring of 1932 to Ward-Hayes Construction Co. of Hamilton, Ohio, for the removal of 500,000 cubic yards of sand and gravel from the river bed of the Great Miami River through the city of Hamilton, Ohio. The river bed is 500 to 600 feet wide and the normal running water about 200 feet wide. The material above grade which was covered by water was excavated and cast over by two draglines, a Link-Belt dragline with a 65-foot boom and a 2-yard Omaha bucket and an Osgood dragline with a 50-foot boom and a 1-yard Page bucket. One handling of the material sufficed to get most of the sand and gravel within loading distance of the 36-inch gage railroad track which was laid along the dry side of the river bottom. After the first cut had been cast over, the Link-Belt dragline started loading cars while the Osgood dragline rehandled some of the material the

General View Showing the Silted Channel of the Great Miami River and Loading of Industrial Railway Train by Dragline

second time. The Osgood dragline also rehandled material underneath the four bridges and around the piers so as to avoid delay to the loading unit.

The material was disposed of on a fill which is to carry a connecting link from a state highway on the north end of the job, and for raising certain city streets and reinforcing the levee on the south end of the job. The hauling equipment consisted of thirty-three 5-yard Western dump cars and two Vulcan 21-ton steam locomotives. The Link-Belt dragline with its 2-yard bucket loaded 2,500 and 3,000 yards of sand and gravel per day into the trains, working three 7½-hour shifts.

150,000 YARDS SUBLET

Ward-Hayes Construction Co. was awarded this contract on a unit price basis at 31 cents per cubic yard measured in the fills. About 150,000 yards was sublet to the Hamilton Gravel Co. on which they used two Bucyrus-Erie draglines with 45-foot booms. One used a 1-yard Page bucket and the other a ¾-yard Page bucket, both loading into a fleet of motor trucks.

PERSONNEL

This river channel maintenance work is being done under the direction of C. H. Eiffert, Chief Engineer, Miami Conservancy District with C. S. Bennett, Assistant and I. L. Kohlman, Resident Engineer. For the Ward-Hayes Construction Co. of Hamilton and Cleveland, Ohio, and Helena, Ark., W. J. Hayes was in charge with S. A. Smith, Superintendent and J. W. Goodwin, Engineer.

Arc Welding a 6,000,000-Gallon Water Storage Tank

A 6,000,000-gallon water storage tank was recently completed by the city of Milwaukee. It is reputed to be the largest tank ever constructed. There is not a rivet in the entire shell, making the structure outstanding both as to design and capacity. This tank is the first step in the development of the Menominee Valley Booster Station project undertaken by the city of Milwaukee, to supply sufficient water pressure to cover peak load conditions in the western and southwestern areas of the city and suburbs.

Water will be pumped from the main pumping stations into the 6,000,000-gallon storage tank during the night when demand loads are at their lowest. Between 5 and 8 o'clock in the evening when peak loads occur, this stored water will be repumped through the mains by the auxiliary station, thus furnishing sufficient pressure under maximum loads.

This entire municipal project was divided into three sections. The construction of the tank comprised one section, while the trenching and pipe laying operations were divided into two sections. The contract for erection and welding of the tank was awarded to the A. O. Smith Corp. of Milwaukee. The contractor used ten gasoline-powered P & H Hansen arc welders. The trenching and pipe laying operations were divided between the Wenzel & Henoch Construction Co. and Kehrein Bros., also of Milwaukee.

Placing Sheet Steel for the Roof of the Tank

Active work on the tank began the latter part of September, 1932, by laying the 165-foot diameter cement foundation. A coating of asphalt was laid upon this circular bed of cement to form the foundation for the steel bottom plates of the tank itself. The bottom of the tank consisted of steel sheeting ⅜-inch thick securely welded. The side walls were next erected. The first row consisted of 1⅜-inch sheets weighing 4 tons each, welded to the floor plates inside and out. The plates were placed in position by three P & H crawler cranes.

Each succeeding row of sheets was slightly thinner than the previous one, in order to allow sufficient room for a satisfactory welding bead on both sides. The entire process of placing the rows of steel sheeting and welding them together was repeated until the top of the tank proper was reached, 37½ feet high. The last sheets were approximately ½-inch in thickness and weighed 1 ton each.

The roof of the tank consisted of welded sheet steel supported on a structural steel work erected in the center of the tank. Three sheets of roofing were welded together on the ground, and placed in position by means of a crawler crane equipped with an 80-foot boom. The sheets, after being placed in position, were then welded down to the structural framework which supported them. The height of the entire structure is 57 feet 3 inches from the ground to the top of the cupola, and over 700 tons of steel were welded together to complete this huge tank.

On a project of this nature, steel erection was most important. Crawler cranes met the situation nicely as with special grapples they were able to move the steel sheeting from place to place and also handle it on the roof. On the siding iron jaw grapples clamped down over the entire width of the sheeting and extended over several feet, to form a support for the sheeting while welding. Two crawler cranes carried a sheet to the proper location and placed it in position. In this manner the 700 tons of steel were handled without a slip.

Patrick McGovern—Contractor

A MASTER builder who rose from the ranks of a pick and shovel man to become one of the largest individual users of modern construction equipment has recently passed away. In an editorial on Patrick McGovern, one of the best known figures in the construction industry in the East, the *New York Sun* stated:

"In building underground structures Patrick McGovern had a proficiency not surpassed, perhaps not matched, by his many competent competitors. He specialized in sewers, aqueducts and subways; his jobs were always means of subterranean transport. The pick-and-shovel immigrant who arrived in America at the age of 20 learned quickly that his class of work could be done quickest and cheapest by using the latest inventions in power machinery. When the $45,000,000 contract for the New York water delivery tunnel was awarded to him McGovern bought more than $2,000,000 of plant and equipment. Starting in at seventeen shafts between Hill View reservoir in Yonkers and Fort Green Park in Brooklyn he bored the 20-mile tunnel in two years less than the time fixed in the contract.

"Applying the same scientific methods, McGovern completed the subway from Fifty-Third Street and Eighth Avenue to Queens with such speed that the tunnel was ready nearly three years ahead of the schedule. He had his $22,000,000 while the city was paying interest on that capital lying inert. No contractor learned earlier than McGovern that the profits in that business depend on quick performance. He took pride in the perfection of his work; his determination to give the buyer a good job was recognized in the construction world."

Fast Work

on Shallow Cut *and* Fill

Potts & Callahan of Baltimore Kept Every One on the Jump

SHALLOW cuts mean slow work to most dirt movers, or at least there is some sort of psychological reaction or inferiority complex or what have you, that keeps them from realizing that there is some fast way that dirt can be moved even in shallow cuts. Potts & Callahan had a small grading job near Marley, Md., where the cut averaged 3 feet and yet actual clocking of the shovel which was loading three trucks showed a truck leaving the shovel every minute and a quarter with four dipperfuls of dirt. They were good generous dipper loads too and one dropped into the trucks every 15 seconds. Another 15 seconds was allowed for one truck moving out and the next moving in.

The Marion 450 steam crawler shovel working in the cut loaded with a quarter swing which, of course, speeded up the work. It was run by a man who has consistently handled 1,200 yards of sandy loam in 9 hours with a 5 to 8-foot bank ahead of him. Because there had been some trouble with grass and brush fires in the district, the shovel had a double thickness of screening over the stack to catch sparks. The trucks, three White trucks from three to seven years old, were running like a lot of spry youngsters from the shovel to the nearby fill, down over the end, for it was only running 2 to 3 feet high, and around to the shovel in a circle that kept down the number of trucks required.

Every one of the truck drivers were men who had been on the same trucks for several years and who knew their work, just how the trucks should be handled and took pride in the appearance of the equipment. One of them apologized when the hood was raised and there was considerable dust on the engine. Yes, we said dust, not muck such as appears on most engines after they have run a few thousand miles. The engines were painted like new, the trucks were all a good sensible battleship gray and totally free from the usual battle scarred appearance of the dirt mover's truck. A methodical maintenance system in the contractor's yard, well-paid truck drivers who took an interest in their equipment and a superintendent and foreman who were always ready to see that adjustments and repairs were made immediately, tell the story of the speed and low cost of the work.

It happened that while we were studying this job one of the trucks stopped off the circular path which the trucks were using in running up to the shovel. The driver jumped off, went underneath and was busy working on something. Did the foreman immediately go over and "Bawl h——l" out of him? He did not; he left the truck driver alone. In a few minutes he was back in the run again with a grin. The spring on his brake had come off and he fixed it himself without a murmur.

This job was the old story of a well paid, well organized crew who knew that they were expected to do a full day's work without a lot of, or in fact any, pro-

(*Continued on page 34*)

One of the Fleet of Trucks Which Handled the 1,200 *Yards of Sandy Loam Loaded by the Steam Shovel in* 9 *Hours*

How the Other Fellow Did It

Ideas That Have Already Proved Helpful to Contractors

Where Does Your Paver Hose Wear Out First?

211. The paver hose inevitably wears out first in the length next the paver. That is where the hose is moved the most and consequently where it is bound to show the first signs of wear. An Indiana contractor developed a very simple method of taking care of this wear, and the method is worthy of the attention of every paving contractor. A steel sleeve with slightly flared ends and just a little larger than the outside diameter of the hose and about 15 inches long was firmly attached to the top of the subgrade planer which was pulled by the paver. The hose was slipped through and a little slack left between the paver and the sleeve. Thus the hose was lifted off the ground at the point of most continuous rubbing and the chances of its being pulled so as to loosen it at the coupling at the paver was eliminated. A neat arrangement, cheap, and very good insurance. 23.5.46

Depressed Runways for Batch Trucks

212. Unless cement cars are run in on a spur track on a fill, it is usually necessary for the runway for the batch trucks receiving the cement to be depressed below grade. If drainage is perfect, that is, if the soil is sandy or gravely, this offers no difficulty. If, however, there is clay in the soil and a spell of wet weather comes along, the trucks have difficulty in operating through the depressed roadway, even if it is laid corduroy with planks. One contractor overcame this by laying steel plates which prevented the trucks cutting into the grade if it were a little soft after a rain. These were the ordinary steel plates used frequently as runs between freight cars and freight platforms. Another contractor used long strips of steel traffic plates carried on planking. 23.5.43

Safety at the Crusher

213. Have you ever noticed the amount of rock, particularly gravel, which pops out of the crusher when the jaws bite in? An Ontario contractor operating a large gravel pit for his 8-mile concrete paving project kept a strip of heavy sheet metal immediately over the crusher to stop flying fragments of stone or whole cobbles that might pop out unexpectedly. This was an effective protection of the men working close by. 23.6.57

Sun Shades for Pavers

214. Having experienced a great deal of trouble with the heat during the summer, particularly in the handling of the concrete by the puddlers, an Indiana contractor devised an awning of burlap which covered the entire grade from the paver back to the finishing machine when that piece of equipment was as far forward as it could run up to the puddlers. The lower end of the awning was fixed to a pole about 20 feet long which was wired to the end of the paver boom. Heavy wires were run to the top of the paver to support the awning, and the swinging of the boom was not interfered with in any manner as the pole at the end turned slightly to equalize the pull from the various wires. This awning or tent proved a great boon to the workmen as they were able to keep out of the glare of the sun during their work. The awning was high enough above the heads of the men to give plenty of air and also to permit the paver-operator to see well ahead and not be held up by having to stoop. 23.5.46

Galvanized Iron Traps for the Cement Box

215. As neat and clean a dumping trap as we have seen anywhere was installed by a contractor in western Minnesota. The dumping traps for the bulk cement were made three-sided of galvanized iron and mounted on wood platforms which were attached to a long pipe acting as the hinge for the traps. The small wood platforms onto which the carts ran had small pipes securely nailed to the floors to act as guides for the wheels of the carts. The traps were counterweighted so that they could be raised readily to clear the cabs of the batch trucks as they drove in and also to prevent the cement being knocked off the batch. Blocks on the platforms acted as stops so that the carts could not run too far and the platforms themselves acted as buffers against which the lips of the carts were struck to empty the cement completely from the carts. 23.5.40

Supporting the Expansion Joints

216. Many different methods are used by contractors to hold up the premoulded-type expansion joints when being set with a cap. The usual method is three and four iron stakes on the side away from the paver and two on the side toward the paver. A contractor who believed in complete support, and yet with a minimum number of stakes to be handled, devised some staples which looked like the double pointed tacks used for laying straw matting but which were much larger, being made of 1-inch rods pointed at the two ends. They were about 9 inches across the top and were driven diagonally so as to set close to the expansion joint on both sides and prevent its moving in either direction. 23.6.48

Make-Up Boxes for Bulk Cement

217. Gilbreth studied the motions of laborers and made many savings in time and energy in brick laying and other activities. An Iowa contractor watched the wheelers on his bulk cement dock and realized that they were losing time in making up the weight of cement at the platform scales, where he used but one make-up box. He immediately installed a second box so that no matter whether a man was left handed or right handed or from which direction he was coming, there was a cement make-up box and shovel immediately at hand. This speeded up the cement carts between the car and the batch trucks. 23.6.47

Two Scales Speed Cement Batches

218. Most contractors having a home-made cement batching system use but one set of platform and beam scales. Where tandem pavers are in use, the installation of but one set of scales tends to slow up production. A job visited not long ago had two sets of scales which prevented any delay in weighing the cement carts. The contractor was loading from two cars of cement and the carts were thus coming from two directions. The double scales simplified the traffic control of the wheelers and gave a smoothness to the running of the dock, which was 80 feet long, sufficient to accommodate the two cars of cement at the same time. The runs from the doors of the box cars were 6 feet wide. The scales were set slightly at an angle at the corners of the runs where they widened into a platform 24 feet wide, extending about 15 feet toward the grade. 23.5.40

The Editor Comments

Public Works or Tax-Paid Doles

A forcefully expressed portrayal of the conditions which will exist over a period of one or two years unless the public works program is pushed with increased energy was made by Charles F. Abbott, Executive-Director, American Institute of Steel Construction, at a meeting of the Structural Board of Trade of Philadelphia. With an investment of two and a half billion dollars in projects which will pay for themselves, the great bulk of our unemployed can be put back to work immediately. These great works are not going forward today despite the fact that Congress enacted the Wagner Bill authorizing the Reconstruction Finance Corp. to make loans on self-liquidating projects for the purpose of "relieving unemployment." Even the best of projects would not be undertaken if it were necessary to borrow money at 7 per cent for their building. That is why so few self-liquidating projects have as yet been financed under the Emergency Act of Congress, that and the fact that the restricting provisions put into the law make it easier and cheaper for the states to borrow money from the Corporation for a "dole" instead. Direct relief money, "dole," can be had at only 3 per cent interest.

"There are indications, however," declared Mr. Abbott, "that the revivifying effects of putting these projects into execution will be realized without the aid of the government. As money becomes more plentiful in the banks and the private lending institutions realize that it is essential to find use for idle funds, these self-liquidating projects will be started. It is unfortunate in the meantime that our government did not rush into the breach sooner and thus spare the country the serious burden of the present unemployment crisis. Had these projects been financed last summer immediately after the enabling law was enacted, a million of the present idle would have been working by now.

"It is a pitiful sight to see thousands of men standing around waiting for a chance blizzard to get an engagement for a few hours cleaning away the snow when they might just as well have been employed building the Tri-Borough Bridge in New York, the Golden Gate Bridge at San Francisco or the Trans-Mississippi Bridge at New Orleans. These latter will prove definite additions to our national wealth, whereas the money spent on soup kitchens is but transitory.

"I believe in governmental economy, but it is not economy to stop investments in civic improvements and civic needs. Destitute men and women must be cared for even though we find it necessary to cut the salaries of civil employees. It is our duty to provide either a 'dole' or work, and I venture to say that the vast majority of our people, both employed and unemployed, would prefer work to charity.

"Worthy projects, like the Catskill Bridge over the Hudson River, the Tri-Borough Bridge in New York City, and many others, will pay for themselves over a period of years, and in the meantime they will add much needed facilities to these congested centers. It is no economy to delay these projects just because a drive is being made on all governments to eliminate wastes in public appropriations and to reduce taxation on the public. The erection of self-liquidating projects will assist greatly in lifting the present tax burden.

"Some cities have appealed for funds to build incinerator plants with figures to prove that they would save the taxpayers enough in four years to pay for the whole investment. The Reconstruction Finance Corp. is compelled to turn the applications down because Congress added a provision that no project could be financed which depends upon taxation, and even a saving in taxation would not make the project subject to aid under the law. If that is a fact then certainly this seems an appropriate time that we look into this matter carefully, and that we endeavor to persuade our legislators to take a more constructive view of the present emergency and adopt a more economical method of dealing with unemployment.

"Our duty to our fellow man requires that we give either work or a dole. The American citizen prefers work to charity. As fast as we can finance these two and a half billion dollars of self-liquidating projects throughout the United States, the fewer workmen there will remain who will need a dole."

Mr. Abbott's statement has our unqualified approval. The Reconstruction Finance Corp. already has one and a half billion dollars available for self-liquidating projects so that this suggestion does not involve the financing of several billion dollars more for some of the suggested projects but only the financing of one billion more. The American people and its financial institution can very well underwrite another billion dollars for the elimination of the dole.

Theodore Reed Kendall

Legal Points for Contractors

These brief abstracts of court decisions in the contracting field may aid you in avoiding legal difficulties. Local ordinances or state laws may alter the conditions in your community. If in doubt consult your own attorney

Edited by A. L. H. Street, Attorney-at-Law

Contractor Presumed to Know Specifications

"I will lay tile conforming to the standard specifications prescribed by the American Society for Testing Materials," said a contractor by his agreement.

By making this agreement the contractor made the standard specifications as much a part of the contract as if every word of them were set out at length in the contract, said the Indiana Supreme Court in the case of Walb Construction Co. v. Chipman,, 175 N. E. 132.

The contractor seems to have been misled by having a book, containing specifications of the Society, of a different edition from that referred to in the contract. But the court said that for this mistake "he can blame no one but himself, and must perform the contract as it was in fact written."

Moral: All contracts should be carefully checked and double checked against documents, which, as Andy would say, are "incorpolated" into the contract.

Defaulting Contractor's Right

Where a contractor or subcontractor has failed to carry out the terms of his agreement, resulting in loss to the other party and discharge of the defaulting contractor or subcontractor, an interesting question usually arises as to what, if anything, the latter is entitled to recover on account of work that has been performed by him under the agreement and is of some benefit to the other party.

An examination of the law reports shows that the courts have uniformly followed a rule that is just in its application. Summarized, the rule is this: Where a contractor or subcontractor has failed to substantially perform his undertaking, and the other party has not waived or excused full performance, the contractor or subcontractor is not entitled to compensation on the contract basis. But if the other party has accepted the benefits of partial performance, and if the contractor or subcontractor acted in good faith, the latter is entitled to the reasonable value of the work done, not exceeding compensation at the contract rate. From this amount is to be deducted damages sustained by the other party through the contractor or subcontractor's failure to fully perform his contract.

To illustrate, suppose that a contractor has agreed to do a job for $20,000 and does work that is worth $10,000 to the owner and then falls down because he cannot raise the money necessary to obtain the required labor and materials. The owner has to pay $15,000 to get the contract job completed by some one else. Under the rule above stated, the first contractor would be entitled to $10,000, less $5,000 to protect the owner against loss.

Another rule applies where the contractor's or subcontractor's default is willful and unjustified. In such cases it is held by the courts that he is not entitled to anything for part performance of a single job, even though the work done by him is beneficial to the other party. The reasoning of the courts in this class of cases is that the work done by the defaulting contractor or subcontractor is of such nature that the other party cannot avoid accepting the work.

To illustrate, a contractor undertakes to construct a building, including a basement, for $10,000. After excavating for the basement and through sheer "cussedness" he abandons the job, or is discharged for neglect or misconduct, he has no right to hold the owner liable for the value of the excavation. The owner cannot avoid accepting this work, unless he be unreasonably expected to fill the excavation so as to avoid being benefited by the defaulting contractor's part performance.

What has been said concerning a defaulting contractor's rights as against the owner applies with full force to the rights of a defaulting subcontractor against a contractor.

Court decisions applying the rules above stated, rendered all over the country, will be found cited at pages 818-820 of 9 Corpus Juris, and corresponding annotations.

Street Contractor Held Not Liable for Injury to Cable

"Your steam shovel damaged our cable under the surface of that street in Paterson where you excavated," complained a telephone company to a contractor, "and we demand reimbursement for the cost of repairing the damage."

"Sorry, old dear," replied the contractor, "but we excavated under a contract with the county and were assured that it was proper for us to proceed to a depth of 17 inches. We had gone but 5 or 6 inches when the injury was done. Furthermore, our eyes are not of the X-ray variety and we did not see or know that you had a cable in that street."

A lawsuit followed and the contractor defeated the telephone company's suit for damages. The New Jersey Supreme Court said, in an opinion handed down November 19, 1930, in the case of New Jersey Bell Telephone Co. v. Kramer, 152 Atl. 186:

"We are of the opinion that, when the county authorities contracted with respondent to excavate to a depth of 17 inches and advised him that it was proper to proceed with the work, he had a right to assume, in the absence of actual notice or knowledge, that he might safely proceed with the work."

Settling with Discharged Employees

When a Syracuse employer discharged an employee, the check given the latter for accrued salary bore the endorsement, "in full payment for all sums due and to become due."

Those eleven words on the check and the employee's act in cashing the check with that endorsement on it, protected the employer against any subsequent claim on the part of the employee for damages, on the ground that he had been wrongfully discharged, if there was a bona fide dispute between the parties as to whether or not there was an agreement for employment extending beyond the time of the discharge. It was so decided by the Appellate Division of the New York Supreme Court, in the case of Amann v. Kemper, 248 N. Y. Supp. 646. In other words, if the employee expected to make any claim for damages on account of his discharge he should not have accepted a check reciting that it was in full payment of sums "to become due," as well as payment for all sums "due."

The decision inspires the thought that in any case when a contractor is settling with a person who is apt to make any sort of claim afterwards respecting past transactions, it is advisable to endorse on a check intended as final settlement the words above quoted or their substantial equivalent.

A Contributor to *No. 2*

Construction Progress

THE achievements of Henry J. Kaiser which have brought him to the position of Director and Chairman of the Executive Committee of the Six Companies, Inc., and President of the Boulder City Co. make him an important figure in the progress of construction of recent years. The organization of Six Companies, Inc., formed by six firms as an agency to bid upon and construct Hoover Dam, is unusual and may establish a precedent for contractors who offer various types of services to band together to bid upon a project, the magnitude of which may prohibit the contract going to one firm. Mr. Kaiser through Bechtel & Kaiser of San Francisco has played an important part in this outstanding project.

Mr. Kaiser's career is typical of the American youth "who made good." He was born in New York State in 1882 and left school at the age of eleven to earn his living. After trying various jobs, he was moved by the spirit of Horace Greeley and taking his advice "went West," arriving in Spokane, Wash., in 1904 where he became engaged in the hardware business, with no thoughts of ever becoming a contractor. Fate, however, seems to have determined Mr. Kaiser's connection with the construction industry for in 1908 he became associated with a sand and gravel company in Spokane. Three years later he joined the J. F. Hill Co. as manager of sand and gravel production. In 1912 he became Pacific Coast Manager for the Canadian Mineral Rubber Co. on paving construction operations in British Columbia. Each position which he held up to this time seems to have been merely a stepping stone leading to the field of activity for which Mr. Kaiser was most suited and in which he was to achieve such success and recognition. The following year he formed the Henry J. Kaiser Co. with headquarters in Vancouver, B. C., confining his operations largely to paving construction. In 1915 he went to the State of Washington as the Kaiser Paving Co., and in 1921 moved his headquarters to Oakland, California.

Since 1913, contracts of the Kaiser Paving Co. have totaled more than $50,000,000, including a single $20,000,000 contract for 500 miles of concrete and bituminous highway in Cuba as well as the construction of 500 concrete bridges. Other work includes city, county and state highway paving approximating 400 miles in Washington and 100 miles in California; two rolled earthfilled dams: the Gordon Valley dam for the City of Vallejo, Calif., and the Philbrook dam for the Pacific Gas & Electric Co.; and levee construction in Mississippi for the Mississippi Levee Commission.

Mr. Kaiser is affiliated with various other enterprises, being President of the Bechtel-Kaiser Rock Co., wholesale producers of sand, gravel and crushed rock in Northern California with a plant located at Oroville; President of the Concrete Products Sales Co., which represents a large Eastern machinery manufacturer as distributor for its concrete mixing machinery and supplies; and Chairman of the Board of Directors of the Bechtel-Kaiser Co., Ltd.

In both the American Road Builders Association and the Associated General Contractors of America, Mr. Kaiser has taken a very active part. Of the former he is a Director, and in January of 1932 was elected Vice President of the national organization of the latter, becoming President in March of the same year upon the death of Colonel W. A. Starrett.

Mr. Kaiser's thinking and experience have led him to the realization of the values and benefits to be derived from group bidding on construction, and the success of the Six Companies, Inc., has demonstrated this fact. In speaking of the Hoover dam project, Mr. Kaiser says:

Boye Studios

Henry J. Kaiser

"The predominating thought presented by many who know of the Six Companies has been raised in one great question: How can six independent contractors ever get along together? But they do. Six individual private contracting firms, each one retaining its identity and its corporate personality, yet at the same time combining their large resources under a single direction and control to execute the enormous task of building the Hoover Dam, are constructing the greatest project in America, the largest dam in the world. They have learned the value of cooperation. Not one action has been taken either by the Executive Committee or by the Board of Directors that has not been unanimous. Wherever the petty jealousies of special interests have raised their heads, they have been overwhelmed by the purpose and meaning of this huge effort which is larger than state boundaries, sectional ambitions or vested interests.

"There is evidence here that competitive companies can work together for a common goal, that proper organization and cooperation can overcome every obstacle—not the least of which is the necessity of having several sources of authority. The Hoover dam project is answering the cynical protest 'It can't be done,' for there is abundant proof that it *is* being done."

Since the start of the Hoover Dam, Mr. Kaiser has taken further steps to prove his contentions regarding group bidding, as is shown in his affiliations as a Director of the Metropolitan Construction Co. which recently bid on an $8,000,000 tunnel project; Chairman of the Executive Committee of Contractors, Inc. which bid on the $10,000,000 San Gabriel dam; and President of Bridge Builders, Inc. which recently bid on the Golden Gate Bridge and which, it is rumored, will probably bid on the Oakland-San Francisco Bay bridge. These combinations include such well known firms as: W. A. Bechtel Co., Bent Bros., Inc., Dravo Contracting Corp., L. E. Dixon Co., Hall-Johnson Co., Missouri Valley Bridge & Iron Co., Raymond Concrete Pile Co., Utah Construction Co., Warren Bros. Co., and Winston Bros. Co.

Construction Industry News

The Calcium Chloride Association has been organized with offices at 4200 Penobscot Bldg., Detroit, Mich. Members of the Association include the Solvay Sales Corp., the Dow Chemical Co., the Michigan Alkali Co. and the Columbia Alkali Corp. Ray A. Giddings, Barberton, Ohio, formerly manager of special product sales for the Columbia Alkali Corp., and previous to that with the Minnesota State Highway Department, has been appointed secretary and will supervise the Association activities including advertising, research and the promotion of the various uses of calcium chloride. The Association succeeds the Calcium Chloride Publicity Committee, formed by the same interests in 1928 to promote the calcium chloride industry. N. W. Ayer & Son, Inc., Philadelphia, has been appointed advertising counsel for the Association.

Kinney Mfg. Co., 3529 Washington St., Boston, Mass., has suffered the loss of Henry K. Potter, who for nineteen years was manager of its Municipal Department. Mr. Potter, who died February 17, was well known in many highway construction organizations.

Mohawk Asphalt Heater Co., Schenectady N. Y., has announced the removal of its factory and general offices to a new modern building at Frankfort, N. Y. This new up-to-date plant will house factory, warehouse, showrooms and offices under one roof. The factory permits straight line production methods for more economical production and for the addition of new lines as conditions improve and their need becomes apparent.

Tuthill Spring Co., 760 Polk St., Chicago, Ill., has announced the appointment of the following new distributors: Lester Knight, Jr., 223 No. Whasatch Ave., Colorado Springs, Colo.; Paul Tholl, Sparks, Nevada; J. D. Evans Equipment Co., Rapid City, So. Dakota; J. V. Mullen, Parkersburg, West Va.; D. H. Beckwith, Shorewood Hills, Madison, Wis.; and J. A. Fansler, Oklahoma City, Okla.

H. C. Beckwith, President and General Manager of The Byers Machine Co., Ravenna, Ohio, who had been suffering declining health for a number of months, died suddenly on January 31. Mr. Beckwith had been associated with The Byers Machine Co. for 17 years and was a well-known figure in the construction equipment industry.

The Thomas Elevator Co., 20 South Hoyne Ave., Chicago, Ill., has announced the change of its name to the Thomas Hoist Co. with no change in ownership, management or personnel. The change is made because the business of the company is and always has been the manufacture of electric, steam and gasoline hoists. The business of leasing hoists will be conducted by a division of the Thomas Hoist Co.

General Electric Co., Schenectady, N. Y., has awarded Charles J. Thomson a citation and an honorarium from the Charles A. Coffin Foundation. Thomson, now a construction foreman, hitch-hiked from Oakland, Calif., to Schenectady in 1924 seeking a new job. In 1931 the General Electric Co. sent him to Russia to supervise the erection of huge waterwheel generators on the Dnieprostroy hydro-electric project. In 1932 the Soviet Government conferred upon him and two other Americans the Order of the Red Banner of Labor in recognition of his services.

Cummins Engine Co., Columbus, Ind., has announced that after careful and thorough tests the Linn Mfg. Corp., Morris, N. Y., has adopted the Cummins 6-cylinder diesel as standard for all diesel-powered Linn tractors because of its low cost of operation and maintenance. Linn tractors are a heavy-duty combination wheel and track-layer type of vehicle used in road construction and a great variety of the heaviest hauling services.

Patzig Testing Laboratories, Des Moines, Iowa, has announced that after April 1, 1933, its offices and laboratories will be located in its new building at 2215 Ingersoll Avenue where larger and modernized facilities are available.

The National Association of Flat Rolled Steel Manufacturers, formerly located in Cleveland, Ohio, has moved its office to 565 Frick Building Annex, Pittsburgh, Pa.

Union Iron Works, Hoboken, N. J., has become a subsidiary of Lidgerwood Mfg. Co., and has moved its activities under a new corporate entity, "Union Iron Works, Inc.," to the general offices and plant of the Lidgerwood Mfg. Co., Elizabeth, N. J. The officers of the new corporation are Lane McLean, Chairman of the Board; Max Schalscha, President; Walter G. Schalscha, Secretary; Gilbert L. Reeh, Treasurer; and Stanley J. Perkins, Director. This plan groups the sales, engineering and manufacturing facilities with the Lidgerwood organization, creating new resources and enlarging its capacity for further developments. Some of the principal products which will now be manufactured by Lidgerwood for the new corporation are pile driving hammers, leads and machinery for land and marine foundation work, air locks of every type, tunnel shields and equipment for subaqueous foundation work, high and low pressure air and hydraulic grout mixers and ejectors, concrete buckets, cableway skips and mine gages.

A New Standard on Forms for Concrete Joist Construction Floors

A NEW American standard on forms for concrete joist construction floors has been approved by the American Standards Association. It covers the main dimensions of removable and permanent forms, pans, or domes made of wood, steel or other material used in concrete ribbed floor construction. The new standard was submitted to the American Standards Association by the Concrete Reinforcing Steel Institute and the National Bureau of Standards. It is published by the American Standards Association, 29 West 39th St., New York City, and may be secured at 5 cents a copy.

Fast Work on Shallow Cut and Fill

(*Continued from page 29*)

fanity, and were pulling for all they were worth to get the dirt moved. The Superintendent told me later that some of the truck drivers had been with the organization for eight or more years and that they had taken work in a wide district so as to be able to keep the men employed. That is another reason why the trucks were on the job for five years and one, No. 3, for nine years. How many other contractors can show a truck that old still running strong and looking as though it had just been put to work a few days before?

The Equipment Distributor

Ginsberg, Barnes & Conway, Inc., is a new firm of distributors recently organized, with offices at 355 Walton Avenue, New York City. Members of the company are Frank Ginsberg, Don Barnes, Jack Conway and Bob Campello, all of whom have had years of experience in the construction equipment field. This company is now the exclusive distributor in the New York territory for Butler Bin Co., Byers Machine Co., Chain Belt Co. and Smith Engineering Works.

Blaisdell-Folz Equipment Co., Cincinnati, Ohio, has purchased the equipment department of the Queen City Supply Co., including the stock and accounts, and has started actual operations at the former's location, 219 West Pearl Street. Besides handling a complete line of contractors' supplies and equipment, this company will also handle a line of industrial equipment. Although this is a new firm in name, it is really a continuance of the equipment department of the Queen City Supply Co. and will be operated by practically the same management, A. C. Blaisdell and Ralph G. Folz, who are the principal owners of the new firm. Other former Queen City Supply Co. employees associated with the new company are M. M. Greene, who will be manager of the parts and service department, and Miss Helen C. Kraeke, who will be office manager.

Cramer Machinery Co., 706 Lewis Bldg., Portland, Oregon, has been organized by Charles P. Cramer who for twelve years was a member of the firm of J. L. Latture Equipment Co. This firm will represent as distributor several of the larger eastern machinery manufacturers, and will deal in a full line of construction machinery.

H. O. Penn Machinery Co., 140th St. and East River, New York City, has recently been appointed exclusive distributor for Marion shovels manufactured by the Marion Steam Shovel Co., Marion, Ohio, in Greater New York, Albany, Long Island and Northern New Jersey. The Marion Shovel Co. also maintains a district office at 3305 Chrysler Bldg., New York City, for the sale of sizes over 2-yard capacity.

Carolina Tractor & Equipment Co., Salisbury, Md., has announced a change of address from 17th and Lee Streets to South Main Extension, Salisbury.

C. B. Davis Engineering Co., Birmingham, Ala., has recently moved from the Brown Marx Building to 1000 43rd Street, South.

John Reiner & Co., New York City, has announced a change of address from 290 Hudson Street to 29 Howard Street, New York City.

The Equipment Co., Boston, Mass., has recently moved from 23-29 Island Street to 8 Gerard Street, Boston.

Arizona Tractor & Equipment Co., Phoenix, Ariz., has announced that since February 15 its new address is 138 South First Avenue, Phoenix.

J. D. Pittman Tractor Co., Birmingham, Ala., is the new name for the former Smith-Pittman Tractor Co., with offices at the same address, 520-26 No. 28th St., Birmingham.

Lucien Q. Moffitt, Inc., Peoples Bank Bldg., Akron, Ohio, has been appointed exclusive distributor by B. F. Goodrich Rubber Co. for Goodrich cutless rubber bearings in the United States and Canada. Mr. Moffitt, who has been manager of the cutless rubber bearing department of Goodrich since this new development in water-lubricated bearings was first placed on the market several years ago, heads the new distributor company.

Obtaining Unemployment Relief

JUDGING from the correspondence received at the headquarters of the Engineers National Relief Fund Committee in New York, apparently many unemployed engineers throughout the United States are unaware that various forms of relief are available in their own communities. Practically every state, county and city has raised or appropriated funds to provide for the relief of the unemployed. These funds are being expended in various ways.

All engineers out of work and in need of assistance should first acquaint themselves with the local method of providing relief. This may be done by getting in touch with any of the following persons in their community: 1, officers of local sections of national engineering scoieties; 2, officers of local engineering clubs; 3, the City Engineer or 4, the County Engineer. If an engineer is so located as to be unable to reach any of the persons mentioned, a letter to the Secretary of the National Society of which he may be a member or which represents his field of activity will bring suggestions as to what seems to be the next best procedure.

Motorists Pay 24.4 Per Cent of Value of Vehicles Annually in Taxes

ACCORDING to a report of the National Taxation Committee of the American Automobile Association an all-time high for taxation of motor vehicles was reached in 1932 with an average tax of $45.28 per vehicle. On a total valuation of $4,505,625,600, motor vehicle property paid $1,099,293,844 in Federal, state and local taxes amounting to a levee of 24.4 per cent per year on the basis of the value of the property. At this rate the average motor vehicle during its life period of seven years pays taxes in the amount of 170.8 per cent of its average value. This tremendous taxation is bound to accelerate the declining registration and decreased use of the motor vehicles unless steps are taken to put motor taxes on a reasonable level to limit the agencies levying them and to safeguard every cent of revenue from these taxes for road purposes.

New Bridge Opened Across Hudson River at Albany, N. Y.

A NEW bridge across the Hudson River between Albany and Rensselaer, N. Y., was formally opened to traffic on January 23, 1933. It is believed that this bridge, which is of the vertical lift type, has the heaviest movable span of its kind in the world. The movable span is 341 feet long and weighs 2,700 tons. It is raised and lowered by two General Electric 250-horsepower, 410-rpm, shunt-wound motors, although either of these motors is capable of performing the task alone.

Control, also General Electric, for the bridge is located in a switch house mounted above the center of the movable span, where the operator has an unobstructed view of both the bridge and the river. As a safety precaution, the entire system is interlocked so that the span cannot be raised until the traffic signals for motorists have automatically turned red, and the gates at both ends are in position. When the span reaches the top of the towers, a signal to proceed is flashed to boats in the river. With the span raised to its maximum height, river craft will have a clearance of 135 feet.

The Perry Adjustable Multi-Pin Planing Mixer

A Multi-Pin Planing Mixer for Road-Mix Jobs

AN adjustable multi-pin planing mixer which is a combination tool designed to mix the aggregate with the bituminous binder on road-mix job has been announced by the Perry Equipment Co., Sidney, Ohio. The Perry adjustable multi-pin planing mixer is equal in width to the Perry adjustable leveling hone and while it is built in sections for convenience in handling, the practical operating unit is made up of seven sections fastened rigidly together with fish plates. The first and last sections are planes, with alternating pin and plane sections between, making an overall length of 21 feet.

The large number of staggered pins, amounting to 903, set at 4-inch intervals, create a thorough horizontal stirring action which completely mixes the aggregate with the binder material in one pass of the machine. The steel-faced bottom boards serve a double purpose; first, as guides for the pins and second, they have a planing or leveling action that permits a thorough mix without disturbing the contour or alignment of the prespread material, thus eliminating any tendency toward segregation of the aggregate. It is stated that this stirring action keys the stone. Contractors using this equipment have been able regularly to complete a 3-inch surfacing on a 20-foot road at the sustained rate of 2 miles per day and under the best conditions as much as 3 miles per day.

Improvements in Detachable Bit Grinder

AN announcement has been made by the Marberg Co., 32 Mechanics Ave., Woonsocket, R. I., that a vital part of the Marberg detachable bit grinder has recently been improved in order to lengthen wear and reduce the cost of upkeep. In the previous model, the horizontal movement of the bit carriage exposed the shaft on which this part travels to the abrasive wear of the emery dust thrown off by the wheel during the grinding operation. Such wear is now prevented by having the main steel shaft enclosed at all times and by deflecting the emery dust by means of a protective flange at the rear of the bit carriage. This improvement reduces practically the only upkeep cost outside of wheel wear.

An Expansion Joint of Cork

IN an endeavor to make use of the permanent resiliency of cork to compensate for the unavoidable expansion and contraction in concrete structures exposed to temperature changes, the Bond Manufacturing Corp., Wilmington, Del., has developed the Cork-Tex expansion joint. Cork-Tex is made of carefully selected cork particles bound together with a phenol formaldehyde type resin. This combination possesses all the permanent resiliency of cork wood, and in addition, the chemical permanence of a synthetic resin.

Tests of Cork-Tex have included freezing and thawing cycles of varying durations, averaging about three days, over a nine months' period and have shown no appreciable effect. These have been amplified by slow freezing and thawing which has been found particularly destructive to brick, stone and concrete. Weathering tests exaggerating as much as possible the worst conditions of actual use were made by half burying strips of Cork-Tex in swampy ground. After a year's exposure there was not the slightest tendency to break down even at the ground line where failure would be first apparent. Cork-Tex is available in any lengths and widths up to 12 inches and thicknesses up to 1 inch.

A New Line of Portable Jaw Crushers

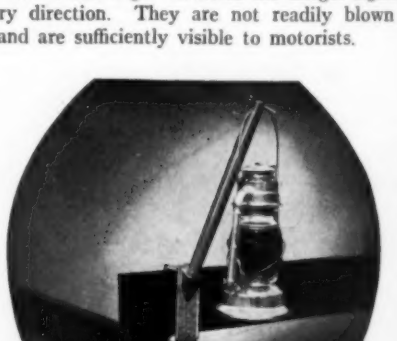
A NEW line of forced feed type jaw crushers, consisting of all standard sizes ranging from 9 x 12-inch to 15 x 36-inch jaw openings, has recently been announced by the Rogers Iron Works Co., Joplin, Mo.

These crushers are constructed of electric steel castings, well proportioned to insure maximum strength with minimum weight, are furnished with a heat-treated alloy steel eccentric shaft, and equipped with bronze bearings or anti-friction bearings. The crusher is mounted on a structural steel truck frame, the truck wheels being equipped with solid roller anti-friction bearings. The crusher drive is of the multiple V-belt type and is enclosed by a sheet metal housing which provides complete safety for the operator. This drive permits the use of minimum drive centers, with a corresponding reduction in wheel base, and increases ease of handling on the job.

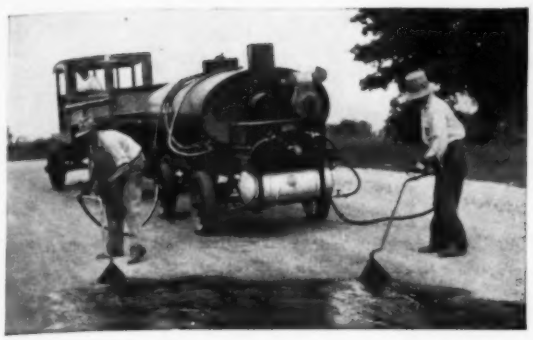
These crushers are mounted with bucket loaders or in many other combinations to meet individual or special requirements.

A Practical Trench Guard

A TRENCH guard made of rust-proof malleable iron with galvanized pipe legs for holding 2 x 6 commercial lumber has been announced by the Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland, Ohio. One complete trench guard consists of a pair of swiveling guard-rail holders of malleable iron, two galvanized ¾-inch threaded supporting pipes, one galvanized ¾-inch threaded, drilled and notched supporting pipe for use as a flag or lantern support, and one red flag, eyeletted. By the use of these swiveled guard rail holders, barricades which maintain an unbroken fence regardless of the shape of excavation may be built up and run along any irregular trench. The guard rails are held at different heights and thus attract greater attention. The threaded galvanized pipe support for lanterns or flags is drilled at the top for the insertion of a nail or pin, thus minimizing loss from theft of lanterns and flags. It holds the danger signal in view from every direction. They are not readily blown over or removed and are sufficiently visible to motorists.



The Cleveland Trench Guard



The Littleford Utility Spray Tank in Action with Two Spray Bars Attached

A Utility Spray Tank

A TRAILER-MOUNTED spray tank made in capacities from 600 to 1,200 gallons has been announced by Littleford Bros., 485 E. Pearl St., Cincinnati, Ohio, making available to highway departments and road contractors a useful piece of equipment for patching, widening curbs, relocating turns, repairing land slides and resurfacing ditches. It can be used economically for surface treatment and shoulder work over short stretches, thus replacing the larger and more expensive pressure distributor and can also be used as a supply tank in conjunction with a pressure distributor.

The spraying unit consists of an air-cooled engine, rotary gear pump, one 25-foot length of 1-inch flexible metal hose and a spray bar. A double outlet can be installed to permit the use of two sprays. Wide spray bars with two or more spray tips can be furnished and are recommended when the outfit is to be used extensively for surface treatment. A special valve arrangement controls the flow of bitumen. The operator can regulate the valve to pump material from tank car to the spray tank, from the spray tank to kettles or distributors, or he can circulate the material through the tank. Asphalt, tar, road oil, cut-back or emulsion is handled equally well.

Two sets of heat distributing flues, made of 5-inch pipe, pass from the rear to the front and back to the rear of the tank. The tubes are properly supported to allow for expansion and contraction. Heat is generated by two LB torch-type oil burners which are fully protected from wind by a special wind-shield. Fuel is supplied to the burner under pressure from a 30-gallon fuel tank. An exhaust manifold covers the rear head of the tank and encloses the pump and piping, keeping these parts thawed out and in operating condition. The No. 101 tank is oval in shape, giving a low center of gravity. It is of welded construction with a steel baffle plate inside to reduce surging of the liquid bitumen. The tank may be purchased either mounted on a standard trailer or unmounted.

A Cushioned Hydraulic Hoist for Dump Bodies

HEAVY-DUTY tubeless hydraulic hoists are mounted beneath Hercules dump bodies, made by Hercules Products, Inc., Evansville, Ind., for 2, 2½ and 3-ton trucks. This No. 2 hoist is used with 10-gage bodies up to 96 inches in length. It has a 6-inch cylinder for the 2-ton chassis and a 7-inch cylinder for 2½ and 3-ton chassis. The newest feature of this hoist is the cushioning effect brought about by a rearrangement of the valves so that when the lever is thrown to drop the body back to loading position, it does not come down with a blow on the truck frame but is cushioned by slowing up of the hydraulic piston.

Hercules dump bodies are made of both 8 and 10-inch gage high resistance steel, electrically welded throughout and heavily reinforced with angles, channels and gussets. Patented adjustable tie rods are an exclusive feature, eliminating strain and insuring the square riding of the bodies. The tail gates open 22 inches or more and have cold rolled steel crossbrace shafts at both top and bottom. The tail gates are strengthened by two full width pressed ribs.

A New Automatic Cement-Weighing Batcher

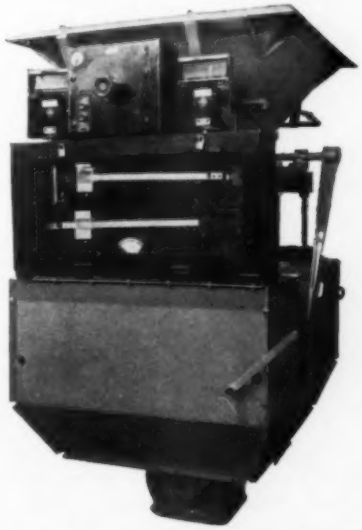
A FULL automatic cement-weighing batcher for concrete mixing plants which is electrically operated has been announced by the Blaw-Knox Co., 2067 Farmers Bank Bldg., Pittsburgh, Pa., in a complete range of sizes. These batchers can be attached to steel cement storage bins, wood bins or concrete bins, and are furnished in any size up to and including batchers capable of handling 10,000 pounds of cement per batch. The popular sizes are 1,000, 2,000 and 3,000-pound units.

The cement-weighing batcher can be equipped with beam scales or with springless dial scales as desired. The electrical contacts are included with the scale equipment for automatic operation. The feeder unit attached to the storage bin consists of a cylindrical rotor with a series of pockets on its circumference. The rotor takes the cement from the storage bins, dumping it into the cement weighing hopper. Power is furnished by means of a totally enclosed electric motor, with reduction gear built in the head. The gear and motor are enclosed in a single dust-tight cage.

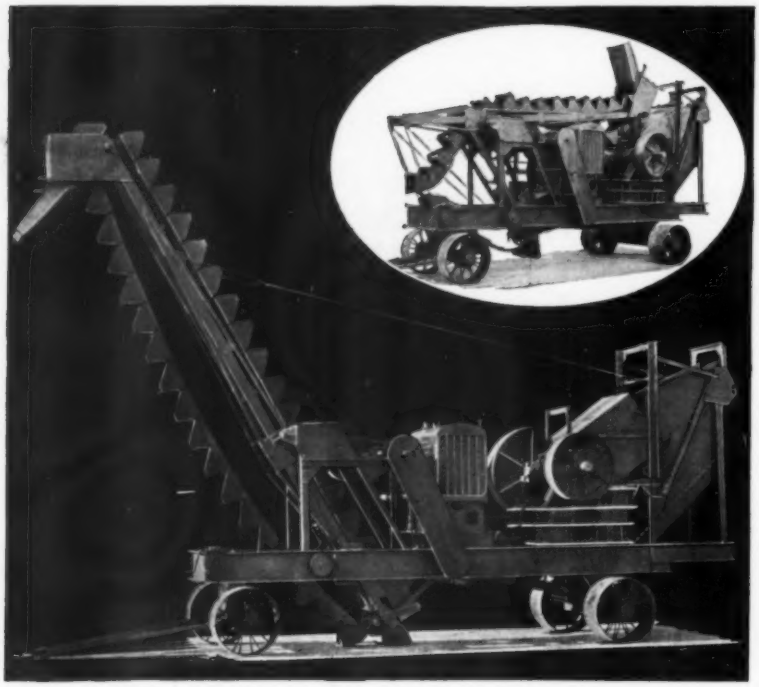
To operate the batcher the operator pushes a button which starts the feeding mechanism and when the required weight of cement has been deposited in the hopper, the feed is automatically cut off. The motor for operating the feeder gate is equipped with an automatic brake so there is no coasting after cut-off.

The discharge can be furnished either of a manual type or power operated with push-button control. The discharge door is toggle operated with a large opening so that the cement will flow rapidly from the batcher and discharge cleanly.

Electrical interlocks are included to prevent discharging the batcher until the required number of pounds are in the hopper. The feeder gate is automatically prevented from rotating while the feeder gate is in operation.



The New Blaw-Knox Cement Weighing Batcher with Rotary Cement Valve



The New Portable Crushing Plant Mounted on the Type H Truck

A New Portable Crushing Plant with Large Hourly Capacity

A NEW truck which mounts a primary crusher and bucket elevator has been developed for crushing caliche and other materials of a similar nature which require machinery capable of handling a large volume of materials per hour. Because of its compactness and the fact that the motor and its driving belt are permanently built into the plant, the Pioneer Type H truck can be very quickly moved into the pit or quarry and operations resumed in a very short time.

This Type H truck is an addition to the "40" series of quarry combinations which the Pioneer Gravel Equipment Mfg. Co., 1519 Central Ave., Minneapolis, Minn., has developed. On this truck is mounted a No. 1536 primary breaker with grizzly bars and motor to drive the crusher and the bucket elevator. This combination is made to be used with a standard No. 3 shaker mounted on a 21-yard bin. The materials are fed to the grizzly bars by standard feeder conveyors. The rock over 2 inches passes over the grizzly bars into the crusher. The materials under 2 inches pass through the grizzly bars onto a short conveyor belt running lengthwise of the trucks under the crusher. All the materials, both from the grizzly bars and from the crusher, are delivered by this conveyor belt into the boot of the bucket elevator.

The bucket elevator delivers the materials to the receiving end of a No. 3 shaker screen mounted over the 21-yard bin. The rocks that are still too large to pass through the perforations of the No. 3 shaker screen are returned to the crusher by means of a conveyor mounted at the side of the bin. All the power for driving the shaker screen conveyors and the bucket elevator is furnished by the motor mounted on the main truck.

If desired the feeder conveyor may be left off and a shovel hopper substituted. This makes a compact outfit when a boom dragline is used for feeding. The plant is also adaptable to hand labor, using a loading platform over the crusher and delivering crushed material to a storage bin or to trucks, permitting its use in emergency highway work.

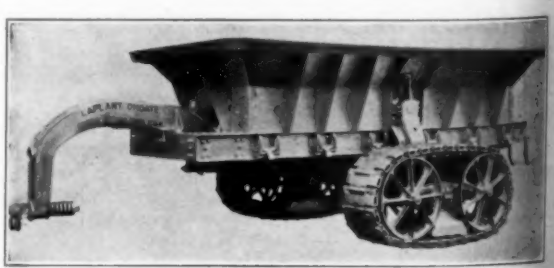
A Portable Grinder for Concrete Bumps

MEETING the rigid specifications of state highway departments for concrete highways and architects for concrete floors has made the application of a portable gasoline engine driven high-speed grinding machine a great labor saving device. Frequently when a contractor completes a concrete highway he finds bumps that can be quickly and cheaply removed by such a machine. The new Mall portable high-speed grinding machine, made by the Mall Tool Co., 7740 So. Chicago Ave., Chicago, Ill., is equipped with a gasoline engine developing 3 to 5 horsepower, driving a high-speed coarse grit bakelite cup grinding wheel running at approximately 3,000 rpm. The machine is mounted on two rubber-tired pressed-steel ball-bearing wheels and is quickly moved from bump to bump along the highway or over a concrete floor. It takes but a few minutes to remove an ordinary bump. The machine is made rugged for rough continuous use and is equipped with ball and roller bearings throughout.

The machine can also be supplied with other attachments for surfacing concrete walls. There is also a hammer unit that can be quickly attached to the machine so that it can be used for chipping concrete and drilling holes.

A 12-Yard Bottom-Dump Wagon

A NEW 12-yard bottom-dump wagon has recently been announced by LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa. This wagon is built with straight body sides, to permit easy and quick dumping of any kind of soil. The extra wide doors and high clearance also permit easy and quick dumping. When the doors drop, the draft immediately lightens so that it is not necessary to shift gears while on the dump. A wide flange is provided at the top of the wagon box, to permit a large top load, and when loading is with a dragline, shovel or elevating grader, tends to prevent spill.

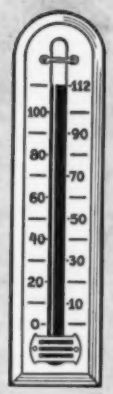


The New 12-Yard Wagon, Showing the Reinforced Straight Body Sides

ACTION

in the MOJAVE DESERT

Three Allis-Chalmers Model "Ls" fighting blistering heat ... abrasive sand ... cutting dust ... supplied the ACTION in building the Mecca to Blythe highway in the lower Mojave Desert. Under these extreme conditions Allis-Chalmers tractors continue to move more yardage at lower cost.



Write for the Action Magazine

ALLIS-CHALMERS

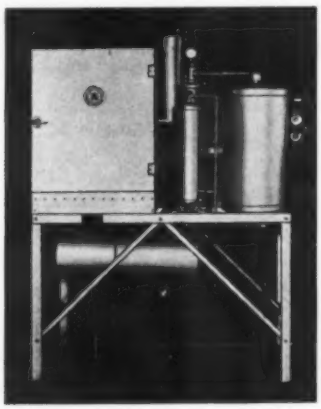
TRACTOR DIVISION—MILWAUKEE, U. S. A.

TRACK TYPE TRACTORS • ELEVATING GRADERS • TRACK TYPE WAGONS
POWER CONTROLLED GRADERS • MOTOR PATROL GRADERS • POWER UNITS
WAGON TRACKS • HAND CONTROLLED GRADERS • WHEEL TYPE TRACTORS

Reclaiming Crankcase Oil

WHEREVER fleets of ten or more trucks are operated, it is now economical to reclaim the oil by means of an automatic reclaimer. A large group of municipalities, counties and hauling contractors have installed oil reclaimers made by Skinner Motors, Inc., 2231 Dalzelle St., Detroit, Mich. The Midget Model has a capacity of 8½ gallons of drainage oil per working day while the Junior Model has a capacity of 2 gallons of refined oil per hour and the Aviation Model 5 gallons of refined oil per hour.

The Midget Model, the smallest of these three oil reclaimers, does not require an expert to install or operate. One of the garage men or mechanics is merely instructed how to use the machine which is entirely automatic. The tank is filled with 8½ gallons of crankcase drainage, the electricity turned on and then left for 5 or 6 hours. At that time the temperature will normally be sufficiently high to open the filter relief valve. The reclaimer thereafter automatically completes the cycle of operations. When all the liquid contaminations have been driven from the oil, the electric heaters of the still shut off automatically. When the oil has cooled to the best temperature for correct filtration, the thermostatically-controlled filter relief valve allows the oil to pass through the filter pads, thus removing all solid matter from the oil.



The Skinner Senior-Aviation Oil Reclaimer

The following morning or whenever the machine is to be again operated, the filter relief valve is closed, and it is ready to reclaim another batch of oil. A new filter pad is installed as required. The majority of the diluent driven from the drainage oil during the reclamation is collected by the machine and is used to distinct advantage as a penetrating oil for lubricating springs, etc. The reclaimer is furnished standard for 110 volt and 220 volt A.C. or D.C.

The complete requirements for its installation are 1½-inch galvanized pipe leading from the reclaimer to outside of the building, and an electrical line. An empty oil drum with slight alterations is needed to collect the crankcase oil.

With electricity at 5 cents per kilowatt hour the cost of reclaiming oil with the Midget Model is 13 cents per gallon, with the Junior Model, 11 cents per gallon and the Aviation Model, 8 cents per gallon. These charges include electric current, new filters and labor. According to lubrication experts, reclaimed oil passes every test of economy and is entirely as satisfactory as new oil. The reclaimed oil is about 80 per cent of the crankcase drainage.

A Portable Light of 1,500 Candlepower

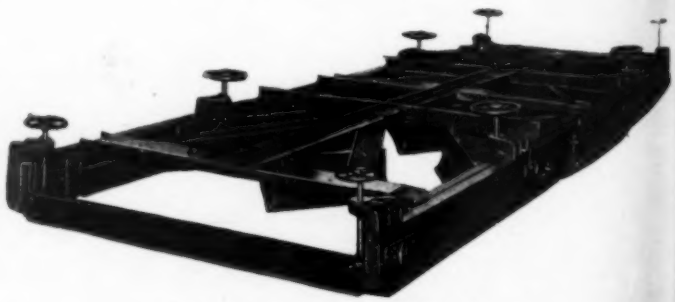
AN acetylene light which weighs only 23 pounds when fully charged and produces 1,500 candlepower for five hours on only 1½ pounds of granulated carbide has been placed on the market by the National Carbide Sales Corp., Lincoln Bldg., New York City. This National carbide V-G handy light No. Y-199 has proved highly effective and adaptable for emergency work by city water departments and other departments as well as by contractors who wish to move the light frequently and desire one which is easily handled and carried about. As more than 75 per cent of its weight is on the bottom, it is not easily tipped over, but if overturned, no harm is done and it will continue to operate satisfactorily if righted again. It operates with National 14 N. D. granulated carbide and water.

A Handy Light for Night Work

A Retread Mixer-Leveler

THE rapid development of the retread type of low cost road construction has brought about a number of new devices for the economical handling of this type of work by contractors. The Hvass retread mixer and leveler developed by Chas. Hvass & Co., Inc., 508 E. 19th St., New York City, has seen considerable service in this work. It can be drawn from either end by a crawler tractor or truck, thus eliminating the necessity of turning it around. It is drawn through the loose stone after the bituminous material has been applied, the curved blades on the diamonds rolling the stone over many times. The bituminous material is lifted from the top of the base where it penetrates after application. This plowing action thoroughly coats the stones with bitumen. The runners on each side of the mixer-leveler can be raised or lowered to slide on either the raised finished half of the road or the shoulder, while the center or mixing section rides close to the base to lift the stones and bituminous material.

An adjustable leveling blade is placed at each end of the mixer-leveler so that coated stones can be leveled off after passing through the mixing blades. The leveling blades are adjustable by means of hand wheels and screws to give the required thickness and crown. The mixing frame is 24 feet long and the runners 28 feet long.



The New Hvass Retread Mixer-Leveler

WANTED—a Tough Job!

Just a few minutes are required to place the BADGER on its wheel mounts, ready for rapid traveling. Compute shovel capacity on earth moved per hour—not bucket size.

—cramped working quarters
—long jumps between jobs

by the AUSTIN BADGER SHOVEL

Here is a machine that is looking for the meanest jobs you have!

It is not just a big shovel cut down to small cubic capacity. Instead it is designed from the ground up to fill your needs for a machine that can be placed on the job quickly—and that is small enough to work freely in places where a big shovel could not even get in.

You can buy a BADGER Shovel for less than the upkeep on some of the shovels you are now using. When conditions require, a very small expenditure will convert it into a CRANE, MAGNET, BACKFILLER, CLAMSHELL or DRAGLINE.

Write for the New BADGER Catalog—just off the press. See this lively machine at work on jobs that stop heavier equipment.

The Austin-Western Road Machinery Company. Home office, 400 N. Michigan Ave., Branches in principal cities.

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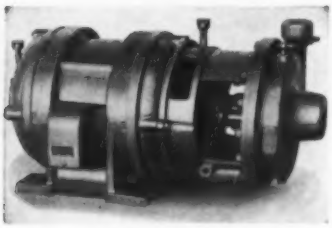
The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.



One of the New Allis-Chalmers SSU Pumping Units

Addition to Line of Pumping Units

THE addition of three sizes of pumping units to the Allis-Chalmers line of SSU motor-driven single-shaft two-bearing pumping units has recently been announced. These pumps work against heads up to 100 pounds and above and cover a range in capacity from 30 gallons per minute to 140 gallons per minute. A single shaft is used on which to mount the motor rotor and the pump impeller, the shaft being supported by two amply sized ball bearings. The pumps and motors are both made by Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

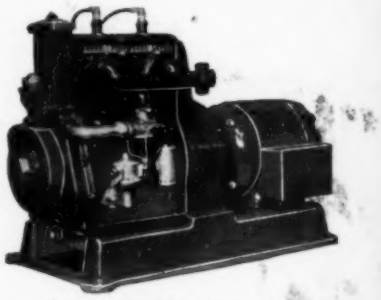
A Governor for Truck Speeds

THE average truck driver is inclined to "step on it". It seems to be human nature to do so but this practice, while not always intentional on the part of the driver, means expense to the owner of the truck or fleet of trucks. For safety and economy, trucks should be limited to a safe and sane speed, which will permit each vehicle to do the work for which it is intended, yet restrict it to a speed where rapid deterioration and depreciation are eliminated.

Hoof Products Co., 162 No. Franklin St., Chicago, Ill., has announced a governor for truck engines which is designed to control automatically the speed of an engine. The Hoof governor, a feature of which is the cantilever spring principle, has only one moving part, the butterfly shaft which turns in two self-lubricated bearings. The roller end of the arm of this shaft contacts the cantilever spring which resists the forces of the intake manifold. The case and body of the governor are made of aluminum die casting, bronze for the shafts and adjusting screw and stainless steel butterfly, with special oil-less bearing and the patented cantilever leaf spring of Swedish steel. The key control permits accurate adjustments of speed, and also interchangeability of governors. Engines naturally vary in efficiency, which the key control is designed to correct to uniform speed. A new key lock serves to adjust the governor to the desired speed and locks the cover in place. This places the control of speed of the truck in the owner's hands with security against tampering. With the Hoof governor, the adjustment can be changed on the initial break-in of the truck every 500 miles, with a final setting at the maximum speed at which the fleet is to be governed. This governor is claimed to perform at no power loss at or below the governed speed and to open up under a load or when the speed drops below the maximum for which it is set. Hoof governors come in a number of types for various sizes of engines.

Generators for Alternating Current

THE new Onan alternating current generators operating from gasoline, gas or distillate have been announced by D. W. Onan & Sons, 408 Royalston Ave., Minneapolis, Minn. These models, which generate 110-volt, 60-cycle, single-phase alternating current, are made in two sizes, 1,000 watts and 2,000 watts. They are designed to fill the requirements for light and power anywhere and are particularly adapted to contractors' portable installations on construction and road work.



One of the New Onan A.C. Generators

These new generators embody many practices of the automotive engines and the use of the powerhouse type of alternating generators. The engine is 4 cycle, air-cooled, with high compression ratio and Silicrome valves. The general design carries the trend for clean streamline appearance, with all moving parts enclosed. Rubber mounting is furnished. Vibration has been reduced to a minimum, all working parts are ground to finish and are of ample size. The cooling system is arranged so that the cold air used for the engine is drawn through an oil cooler, keeping the body of the oil heavy, regardless of load, and insuring efficient operation. Lubrication is supplied through the crankshaft to all bearings from a pressure pump and regulator. The starting system, with remote control switches located anywhere desired, provides easy and convenient starting.

The Outdoor Exhibit of the Austin-Western Road Machinery Co. at the Road Show in Detroit Supplemented a Large Showing Within the Airport

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